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WINNING WITH WIRELESS

Although IT spending and hiring will be down dramatically in the coming year, investments in wireless applications, hiring and training will still be strong, as professionals increasingly want to be connected to the company from virtually anywhere. In our special report, we look at jobs in wireless technologies and the workers who will fill them, and at how companies will manage their wireless systems. **STORIES BEGIN ON PAGE 24.**

ROI ONLINE

Head to *Computerworld's* ROI Web site for online-only features, including "Ranking the Value of Business Relationships," in which two experts detail how to calculate the risks and rewards of interenterprise partnerships. www.computerworld.com/roi



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7 Online holiday shopping is holding its own, despite an economic downturn that has curtailed most retailers' online IT projects.

8 Surrendering security to service providers can be dangerous, attendees at last week's Info-security Conference warned.

10 Financial services IT managers fret over a Treasury Department edict that they change their check-clearing processes.

12 An effort is afoot to organize the IT community's volunteer resources so that altruism isn't wasted in the event of another disaster.



For breaking news, updated twice daily, visit the *Computerworld.com* Web site:

www.computerworld.com/q/q4000

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ONLINE

IT SPENDING

Recession, cutbacks — what have they done to your IT budget? Let us know in our online forum.

www.computerworld.com/q?q1330

OUTSMARTED BY CONVENIENCE

Community editor Brian Sullivan was inconvenienced by trying to make his life more convenient. Companies can learn some lessons from his experience about how to offer more effective customer service online.

www.computerworld.com/ecommmerce

WHO IS THE BEST DIGITAL PHOTO PROCESSOR?

The answer is picture perfect to online managing editor Sharon Machlis, who tests three services that create prints from digital files.

www.computerworld.com/ecommmerce

DON'T OVERLOOK EDIRECTORY

Active Directory gets the spotlight, but Novell's eDirectory is providing the technically superior alternative, says *Computerworld* community member Bryan Emmons.

www.computerworld.com/community/os

AT DEADLINE

Holdout States Seek Curbs on Microsoft

Nine states and the District of Columbia submitted a series of proposed restrictions on Microsoft Corp., including a requirement that the company offer stripped-down versions of Windows that don't contain its applications. Microsoft called the proposal, an alternative to its antitrust settlement deal with the U.S. Department of Justice, "extreme and not commensurate with what is left of the case."

SAP to Lay Off 7% of Its U.S. Workforce

SAP AG said it plans to cut 7% of the workers at its SAP America Inc. subsidiary in Newtown Square, Pa., and reduce the number of vertical industry sales groups at the unit from 21 to 12. SAP, which warned in October that cost-cutting actions were in the works, is laying off about 300 employees in the U.S. The software vendor said the cutbacks will be finished this month.

Microsoft Warns of Exchange 5.5 Hole

Microsoft warned of another security hole in the Outlook Web Access module that's included in its Exchange 5.5 messaging software. The flaw could allow attackers to gain unauthorized access to Outlook mailboxes by embedding malicious code in HTML e-mail messages, Microsoft said. It urged affected users to install a new patch.

Palm Gets \$50M From Unnamed Investor

Santa Clara, Calif.-based Palm Inc. said it received a \$50 million cash infusion by selling a convertible note to an unidentified investor. The handheld computer maker plans to use the money to help fund sales operations and its development of new wireless devices.

Some Users Slow to Jump on 9i Upgrade

Worried over Oracle compatibility issues, IT spending during economic slump

BY MARC L. SONGINI
SAN FRANCISCO

ORACLE CORP. last week unveiled an upgrade of its Oracle9i application server software and pitched its latest database to users, claiming that the two technologies can simplify the integration and management of corporate IT architectures.

Attendees at Oracle's OpenWorld conference here said they were intrigued by the claims. For example, the company pushed the clustering features of the Oracle9i database, which was released in June, as a way for users to save money on hardware costs.

But the new database has had only limited adoption thus far, said James Governor, an analyst at Illuminata Inc. in Nashua, N.H., so it's hard to pass judgment on how its clustering capabilities will work in future installations. He said some server vendors may still need to tune their systems to support high-performance clustering.

Governor said the biggest 9i database rollouts to date have been on Compaq Computer Corp.'s Unix systems, which already include extensive clustering capabilities that were developed by Digital Equip-

ment Corp. before it was acquired by Compaq.

In addition, not all users are ready to invest in Oracle's new technology, given the current state of the economy and IT budgets. For example, a database administrator at a network hardware vendor that uses Oracle8i said his company is trying to hold off on an upgrade.

"We're being told to make do with what we have," said the administrator, who asked not to be identified. "We'd love to be in a position where we had to use [the clustering features in 9i]."

Certification Concerns

Other users are waiting for application vendors to certify their products for use with Oracle9i. That's the case at Kingsport, Tenn.-based Eastman Chemical Co., which uses Oracle8i as the database for its

AT A GLANCE What It Has

The Oracle9i database includes these new features:

- The ability to run software across multiple servers as if it were on a single machine.
- A tool that lets users switch to a secondary database without the need for custom coding.
- Integrated online analytical processing, data mining and data extraction functionality.
- Self-tuning and self-management capabilities that automate database operations.

SAP AG enterprise resource planning system, said George Miles, a senior systems associate at the chemical maker.

Miles said Eastman is interested in some of 9i's new features, such as disk space management, which is supposed to boost performance and data availability. The company might upgrade next year, once SAP supports Oracle9i with its R/3 applications, he noted.

A spokesman for SAP America Inc. said R/3 should be tied

to 9i by the middle of next year, but that won't include Oracle's Real Application Cluster technology, which SAP hasn't yet committed to supporting.

Alwyn Santos, a database administrator at Comark Inc. in Bloomingdale, Ill., said the \$1.55 billion technology reseller is also waiting for SAP to certify 9i so it can upgrade. In addition, Santos, who didn't attend OpenWorld, criticized Oracle's database pricing and characterized the vendor as "greedy." But, he said, 9i does appear to include "great technology."

Oracle claimed that its prices are in line with the fees charged by other database vendors. In response to complaints from users, the company eliminated a controversial capacity-based licensing approach last spring and began switching its database users to per-processor pricing.

Amazon.com Inc. has Oracle9i in limited use and is happy with the database's performance and availability features, said Matthew Swann, director of database systems and engineering at the Seattle-based online retailer. But Swann said he's putting off a full rollout of the database until after the holiday shopping season. ■

9i Upgrade Adds Java, Web Support

Release 2 of Oracle's 9i Application Server is due to support Java 2 Enterprise Edition, as well as Web technologies such as the Simple Object Access Protocol and the Universal Description, Discovery and Integration directory of business-to-business services.

Oracle said a free developers' edition of the upgrade is available for downloading from its Web site. Standard and enterprise editions of the software are scheduled to ship in the first quarter.

The California Public Employees Retirement System (Calpers) uses the 9i application server and expects the Java support in Release 2 to help reduce the cost of tying together different enterprise applications, said Jack Corrie, division chief of IT services for the Sacramento-based pension fund.

"Java 2 is a major piece of my strategy," Corrie said. "It gives you the ability to have a strategy to move to a less-complex environment." Calpers assembled its IT architecture in piecemeal fashion and has to do constant maintenance work and integration testing as applications are added or upgraded, he said.

Corrie's annual operating budget totals approximately \$40 million. But the 9i software should reduce costs and ease integration complexity by providing a single platform for connecting applications, he said.

Mark Dixon, IT director of service provision at London-based Barclays Bank PLC, said the financial services firm is looking to roll out the 9i application server during the next two years to provide a uni-

fied, consistent technology infrastructure for its clients.

Barclays started going live with 9i late last month, even though it's not a big user of Oracle's flagship databases. The bank's customer relationship management systems are built on Oracle software, but Dixon said Barclays relies primarily on the mainframe version of IBM's DB2 database.

Scott Lee Clawson, director of application server and network services marketing at Oracle, said the software vendor views its application server as a separate product line that can be used by customers who have bought rival databases.

Dixon said Barclays is running IBM's WebSphere application server on some systems as insurance; the bank has traditionally been an IBM shop and thus wanted to evaluate WebSphere as well.

— Marc L. Songini

Correction

In his Dec. 3 column [Business, "Fighting McKinsey"] on McKinsey & Co.'s recent report "IT and Productivity," Paul A. Strassmann's biography should have noted that he agrees with the report's broader conclusion that IT spending and productivity are unrelated.

Online Sales Strong, but E-Retailers Cautious on Spending

Holiday purchasing consistent with expectations, but some projects on hold

BY CAROL SLIWA

This year's online holiday shopping season may be used as a barometer to gauge the effects of the economic downturn and the tragic events of Sept. 11.

Early signs are that the season is progressing roughly as predicted — from growth in online sales to the scaling back of major IT projects retailers have put on the back burner in the face of grim financial times.

Nielsen/NetRatings Inc. in Milpitas, Calif., hasn't revised its estimates that 106 million consumers will shop online this year, an increase of 27% from last year, and that they will spend \$10 billion, a 43% increase over spending a year ago. Traffic soared 59% from the last week of October to the week ended Dec. 2, compared with 62% during a similar period last year.

"This year is shaping up to be a year of business as usual, dealing with very challenging economic times," said Lisa Strand, director and chief analyst at Nielsen/NetRatings.

San Jose-based GartnerG2, a research unit of Stamford, Conn.-based Gartner Inc., tweaked its \$11.9 billion fourth-quarter projection only "a hair" downward in the aftermath of Sept. 11, said research director David Schehr.

"It should be, within the U.S., a year of nice, reasonable, steady organic growth as more and more consumers begin to use the Internet for at least some of their holiday buying," Schehr predicted.

But few retailers were able to complete any of the major IT projects they had undertaken. Gartner analyst Geri Spieler said clients attending her firm's retail conference the week before Sept. 11 reported that they hadn't done any significant work to improve their

Web sites "because they knew the economy had gone down." Spieler said some retailers beefed up servers, redesigned sites to improve navigation and finished scheduled projects, "but they did not go ahead with things like real-time inventory."

Few Trailblazers

Sears, Roebuck and Co. stands in marked contrast. For the first time, the Hoffman Estates, Ill.-based retailer is giving holiday shoppers the chance to order online and pick up items in its stores.

To offer that capability, Sears had to implement technology to enable near-real-time inventory checks so customers can determine whether an item is in stock at a given store, said Ann Woolman, a spokeswoman for the retailer. The item is then plucked from the shelf and sent to merchandise pickup, triggering an e-mail confirmation to the customer, she explained.

Sears now joins trailblazer Circuit City Stores Inc. in Richmond, Va., as one of the few retailers that can perform

the inventory checks necessary to enable in-store pickup. Gartner estimated last year that less than 2% of online sites could conduct real-time inventory checks.

But few retailers accomplished such ambitious IT goals in time for this holiday season. Analysts said they're still seeing investments in customer relationship management systems, financial applications and the replacement of aging legacy systems. But they're also quick to note that retailers are careful to evaluate

payback, and if they're multichannel retailers, they're more cautious about spending money on their Web operations.

"The Web is just another channel now," said Lindsay Parker, a senior manager at New York-based Deloitte & Touche LLP's consumer business practice. "It's not really large or compelling enough to spin off or to lavish extra attention and money on. The return is not really such that it warrants the extra cash at this point."

"Once the pressure from the

pure plays subsided, retailers began... to realize they needed to be smarter on how they spend their IT dollars," said Jeff Roster, an analyst at San Jose-based Gartner Dataquest.

Some retailers have little choice but to keep up with the competition. New York-based Barnesandnoble.com Inc. went ahead with IT work to improve customer service, despite economic conditions. The retailer now offers customers the ability to buy online and return items at a store location, joining other multichannel retailers that have provided that capability for some time, said spokeswoman Carolyn Brown.

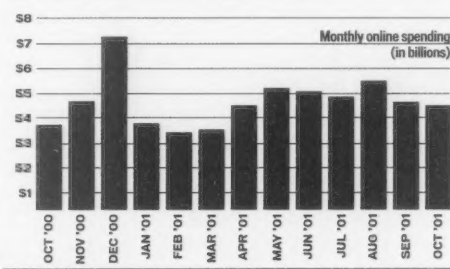
The company is also giving customers the ability to place orders in-store for home or office delivery. But those IT projects "were started before the economy got bad," Brown acknowledged.

Despite facing pressure to turn a profit, Seattle-based Amazon.com Inc. also put its IT staff to work, doing the necessary front- and back-end systems integration to make it easier for customers to check the status of their orders, ship dates and arrival times.

"It's all about giving the customer better information," said spokeswoman Patty Smith. ▀

Holding Its Own

Online shopping dipped only slightly in September and October, and Nielsen/NetRatings analysts maintain their prediction that consumers will spend \$10 billion online during the current holiday season, an increase of 43% from last year.



SOURCE: NIELSEN/NETRATINGS AND HARRIS INTERACTIVE, MILPITAS, CALIF.
NOTE: CHART IS BASED ON A MONTHLY SURVEY OF 30,000 TO 36,000 ONLINE USERS.

WorldCom Plugs Hole in Internal Data Network

BY TODD R. WEISS

WorldCom Inc. last week said it fixed a security hole in its internal data network that apparently had left the networks of some of its biggest corporate customers vulnerable to intruders.

WorldCom confirmed that it was alerted to the existence of the hole by a 20-year-old hacker who had managed to penetrate the company's administrative network on multiple

occasions without being detected. No customer systems or networks were compromised before the repairs were made late last month, said Jennifer Baker, a spokeswoman for the provider of telecommunications and data networking services.

Baker said the problem was caused by a human error that allowed a router on WorldCom's network to use an "inappropriate filter." As a result,

she added, "unauthorized access could be made to the administrative internal data network" run by the company.

WorldCom's technical team immediately removed the filter after being informed of the hole on Nov. 30 and then reconfigured the router, Baker said. She declined to comment in more detail on the original configuration of the router.

The hole was discovered by Adrian Lamo, a San Francisco resident with a history of exploring the inner workings of corporate networks in search of weaknesses.

Lamo, who describes himself as more of a security researcher than a hacker, said he

contacted WorldCom via an intermediary at SecurityFocus.com Inc. in San Mateo, Calif.

Over a period of several months, Lamo said, he was able to dig deep into WorldCom's network and gain access to in-house system tools that could have given him access to the networks of the company's customers. "All the information that I needed was there," he said.

Lamo said he neither sought nor received any payment for providing the information about the hole to WorldCom. Baker confirmed that Lamo assisted the company in making the repairs and said that WorldCom appreciated his help. ▀

Quick Link

To read about retailers' strategies for promoting online holiday shopping, visit:

www.computerworld.com/q725710

Outsource Security With Care, Conference Attendees Warn

What you outsource and to whom are key considerations in security contracts

BY JAIKUMAR VIJAYAN

WHEN IT comes to outsourcing security functions to a third-party, look before you leap. That was the advice of users and analysts at the Infosecurity Conference and Exhibition in New York last week.

Despite the apparent management benefits that can be gained by handing over security functions to service providers, companies are asking for trouble if they don't pay close attention to what they outsource, the terms and conditions of their contracts and to whom they outsource, said conference attendees.

"Most companies tend to outsource before they have thought through what they want," said Steve Hunt, an analyst at Cambridge, Mass.-based Giga Information Group Inc., during a conference session on the topic. "To some degree, all they are doing is surrendering their security [to service providers]."

The concerns come at a time when a growing number of corporations are looking to hand over security tasks to service providers. The market for managed security services is expected to top \$17 billion by the end of 2004 as a result of a deepening skills shortage and the complexity of managing enterprise security environments, according to Framingham, Mass.-based IDC.

The focus of many outsourcing arrangements is usually on protecting against viruses, worms and malicious hackers, rather than on addressing business concerns such as financial loss or a compromise of customer privacy as a result of a

security breach, Hunt said.

"The whole concept has been on building a security bubble around all of your IT assets," said Edward Carubis, CIO at New York City's Department of Health.

Most outsourced services are directed at building defenses such as firewalls and intrusion-detection services from the network perimeter in. Instead, the effort should be on "building out your defenses from the inside" by focusing on each information

asset, Carubis explained.

It's also important to distinguish between tactical and strategic security functions when outsourcing, according to Susan Read-Miller, an analyst at eSecurity Online, a security services subsidiary of Ernst & Young LLP in Kansas City, Mo.

For instance, a firewall that functions as the last line of defense in front of a vital database is strategic, but a firewall at the outer perimeter of a network isn't and may be outsourced, Hunt said.

He suggested that companies pay attention to the following things when outsourcing their security functions:

■ Outsource only the tactical

and temporary tasks. Any security function that involves the protection of strategic assets needs to be kept in-house.

■ Review all terms and conditions as well as service-level agreements. Try to avoid long-term contracts.

■ Avoid conflicts of interest when signing up with service providers. For instance, don't let firewall services be handled by the same vendor that provides intrusion-monitoring services. Use separate vendors for vulnerability analysis and penetration testing.

■ Use due diligence. For example, before forking out large sums of money for vulnerability assessments, be sure to

take obvious steps such as patching software, ensuring strong passwords and closing open ports. Only then hire a vulnerability assessment service to find out if anything has been missed.

■ Check the vendor. Ask for references, and make sure the company has a specific understanding and knowledge of your business. ■

AT A GLANCE

Wise Moves

■ Outsource only tactical and temporary security tasks, not strategically important ones.

■ Know your vendor: Ask for references.

■ Make sure the vendor understands your business.

■ Avoid outsourcing multiple conflicting services to the same vendor.

■ Avoid long-term outsourcing contracts. Review service-level agreements periodically.

SOURCE: GIGA INFORMATION GROUP INC.

Cendant Signs \$1.4B IT Outsourcing Deal With IBM

BY JENNIFER DISABATINO

Cendant Corp. will outsource many of its IT operations to IBM in a 10-year, \$1.4 billion deal that covers more than 40 business units in the real estate, financial and travel industries.

In an announcement last week, IBM said it will manage the New York-based conglomerate's data operations, run its servers and host many of the Web sites and interactive services at Cendant's subsidiaries. Among those subsidiaries are mammoth travel reservation systems for airlines, hotels and car rental companies, including Galileo International Inc., one of the world's largest global distribution systems (GDS), and Avis Group Holdings Inc. Other Cendant subsidiaries include Century 21 Real Estate Corp., Coldwell Banker Real Estate Corp. and Howard Johnson International Inc.

"Given IBM's strong global travel industry expertise, the

company is uniquely equipped to help us establish a world-class data processing and technology infrastructure," said Tom Christopol, senior executive vice president and chief administrative officer at Cendant, in the announcement.

IBM will manage more than 1,400 servers at Cendant's data center in Denver, according to Linda Hanson, an IBM spokeswoman. Galileo handles reservations for 500 airlines, 47,000 hotel properties and 40 rental

car companies over a network that provides service to about 44,000 travel agents.

The outsourcing deal follows a similar announcement by Galileo rival Sabre Holdings Corp. in Fort Worth, Texas, which sold its airline IT outsourcing business to Plano-Texas-based Electronic Data Systems Corp. in March for \$3 billion.

"Cendant is following the lead set by Sabre," said analyst Henry Hartevelt at Forrester Research Inc. in Cambridge, Mass. "They want to try to focus on the core technology at hand necessary to run the GDSs. They don't want to get involved in the day-to-day repairing of computers."

The deal will allow Cendant to reduce staffing and enable Cendant subsidiaries to focus on new technology for their reservation systems.

"Galileo had been an undernourished GDS because they were up for sale for a year or more," Hartevelt said. During that time, Galileo wasn't making technology investments.

Ted Deutsch, a spokesman for Cendant subsidiary Avis, agreed that the deal will help technological development at his company. "Hopefully, this will free Avis up to a certain extent for IT staff to do other projects, to help us to innovate," he said.

An IBM Global Services facility in Toronto will provide help desk and desktop support services to thousands of Cendant employees at Avis, WizCom International Ltd. and Cendant's real estate companies, Hanson said. It will provide on-site desktop support services to thousands of employees at Cendant's corporate offices and in several remote locations.

Approximately 500 Cendant employees will join IBM Global Services. ■

Cendant/IBM Agreement

Cendant will outsource its IT management to IBM for \$1.4 billion over 10 years. Cendant's subsidiaries include:

- ▶ Avis Group Holdings
- ▶ Century 21 Real Estate
- ▶ Coldwell Banker Real Estate
- ▶ Days Inn Worldwide Inc.
- ▶ ERA Franchise Systems Inc.
- ▶ Fairfield Resorts Inc.
- ▶ Galileo International
- ▶ Howard Johnson International
- ▶ Ramada Franchise Systems Inc.
- ▶ Super 8 Motels Inc.
- ▶ Travelodge Hotels Inc.
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BRIEFS

Office Depot Hires Quaker Oats CIO

Delray Beach, Fla.-based Office Depot Inc. named Patricia Morrison to take over as CIO for William Seltzer, who said in August that he would retire at year's end. Morrison, 42, has spent the past 18 months as CIO at The Quaker Oats Co. in Chicago. Office Depot said she will report to CEO Bruce Nelson and be responsible for the office supply retailer's global information systems.

Intel Raises Revenue Forecast for Quarter

Intel Corp. increased its fourth-quarter revenue forecast to between \$6.7 billion and \$6.9 billion, up from a previous estimate of \$6.2 billion to \$6.8 billion. The company said microprocessor sales have been higher than expected, with demand for its Pentium 4 chips exceeding supplies. But the new forecast is still well below last year's fourth-quarter revenue total of \$8.7 billion.

New Worm Tries to Delete Program Files

An e-mail worm that attempts to delete some program files on infected PCs, including firewall applications, began spreading last week. Antivirus software vendors said the worm, dubbed Goner, masquerades as a screen saver contained in an attachment labeled Goner.scr. It targets users of Microsoft Corp.'s Outlook e-mail software and the ICQ online chat application, they added.

Short Takes

Base compensation for IT workers is expected to rise by an average of just 0.1% next year, according to a survey by RHI CONSULTING in Menlo Park, Calif. . . . The U.S. government formally adopted a new data encryption standard that was originally selected by the U.S. DEPARTMENT OF COMMERCE last year.

Finance Firms Fret Over Check Clearing

Fear back-end systems won't be ready in time to comply with Treasury changes

BY LUCAS MEARIAN

A TREASURY Department edict that will force banks to change their check-clearing processes a year ahead of schedule is causing a furor in the banking industry.

The Treasury's plan to convert all paper checks it receives into automated clearinghouse (ACH) electronic debit entries by early next year has some banks worried that their back-end systems won't be ready in time and that deviating from current rules will create opportunities for fraud on a massive scale.

Gary Grippo, chief architect of e-commerce at the financial management service of the Treasury, said the move from paper to electronic transactions will cut the government's vastly inconsistent check-processing times, which now range from three to 90 days, to one day.

The processing discrepancy is the result of the different ways in which the government receives checks, according to the Treasury. For example, park rangers collecting entry fees from tourists at national parks might wait weeks before depositing checks in a bank. Checks handed over the counter to Internal Revenue Service agents normally are processed in three days.

Save on Manpower

"We will definitely save on manpower with this process. Government agencies processing collections won't need to manually handle the checks and physically handle deposits," Grippo said. "And we'll have much richer information about the revenue stream into

the government, which helps in cash forecasting."

The government's conversion to ACH, which will cost about \$10 million, involves 3,000 to 5,000 new computer terminals and accompanying software.

The Treasury normally operates by the same ACH rules as the banking industry, which isn't planning to make the change until 2003.

Time Crunch

Banks are worried that an earlier shift jeopardizes their ability to link ACH systems with paper check systems for tasks like stopping payments and reconciling accounts.

"How much time before they get integrated, I don't know. We're talking about major core processing changes," said Steven Schutze, director of e-strategies at the American Bankers Association (ABA) in Washington.

While the government conversion will affect all checks, consumer and corporate, the ABA said there is more risk with corporate checks because they are generally written for larger amounts and they are drawn on accounts that have higher balances.

However, Jim Van Dyke, a financial services analyst at Jupiter Media Metrix Inc. in New York, said he has heard corporate America's complaints about new government regulations before.

"I think what's very interesting is, whenever you're looking at government mandates on a massive scale forcing change, the industry resists because they don't like outsiders forcing them to do something," Van Dyke said. "They think that they're the best ones to de-

cide the technology and the nature of change, even if the government can reduce cost and increase efficiency."

All banks have some electronic payment capabilities online now, Van Dyke said. "It's just a matter of moving closer to 100% of transactions done electronically," he added.

Patrick Frawley, senior vice president of regulatory relations at Charlotte, N.C.-based Bank of America, said in a comment letter to the Treasury that "at this time, corporate check conversion at the point of purchase is not feasible" because ACH debit filters and check-fraud protection "at the account holder's financial institution do not accommodate spontaneous conversion from check to ACH."

Schutze agreed. "Corpora-

tions tell banks things like, 'Here's all the checks I've issued, their serial numbers, the payee and the amount. If they don't match, then you know it could be fraudulent,'" he said. "Catches like that are not currently integrated into the processing of an ACH transaction," he added.

Donald Hollingsworth, assistant treasurer at St. Louis-based energy company Ameren Corp. and chairman of the Payment Advisory Group of the Bethesda, Md.-based Association of Financial Professionals Inc., said that at the very least, the Treasury needs to put in place security measures to combat fraud.

"If, for some reason, we don't want to convert to ACH — let's say we need proof of payment and definitely want that piece of paper — there's no way to opt out of this right now," Hollingsworth said.

Grippo said the government would be mindful of banks' concerns about cash flow and would ensure that protections against fraud are in place. ■

Check-Processing Flap

What is ACH, and who uses it?

ACH is a secure payment-transfer system that connects all U.S. financial institutions. The ACH network acts as the central clearing facility for all electronic fund transfer transactions that occur nationwide. The four ACH operators are the American Clearing House Association, the Electronic Payments Network, the Federal Reserve System and VisaNet.

The ACH network serves 20,000 financial institutions, 2.5 million businesses and 100 million individuals. It is commonly used for direct deposit of paychecks and government benefits such as Social Security, direct payment of consumer bills, business-to-business payments, federal tax payments and, increasingly, e-commerce payments.

Pros and cons of moving to electronic debit entries through ACH in 2002



■ It would save on government manpower used to physically handle bank deposits and manually enter check information.

■ It would provide the government with more real-time information about its cash flow.

■ It would provide a more accessible picture of what kind of payments are being made to the government and who is making them.



■ Converting to ACH before banks are ready could leave them open to fraud because they would be unable to cross-check electronic debits against current paper-check accounting methods.

■ It would require costly back-end integration at banks, which wouldn't see any immediate cost benefits.

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— Microsoft Windows NT Server Resource Guide

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IT Redundancy Helps Bond Trader Rebound From Attacks

Technology unit restored services to hard-hit Cantor Fitzgerald in 48 hours

BY JAIKUMAR VIJAYAN
ROCHELLE PARK, N.J.

FEW COMPANIES build disaster recovery plans that prepare for the destruction of their primary data center and the loss of every single person in it.

Neither did eSpeed Inc., a business-to-business online marketplace spin-off and IT services arm of New York-based bond trading giant Cantor Fitzgerald LP, whose offices were destroyed in the World Trade Center attacks.

But despite the devastation that eSpeed suffered in the Sept. 11 attacks — which took the lives of 180 of its workers among a total of 733 Cantor employees who were killed — Cantor was ready to trade again barely two days later, in time for the Sept. 13 reopening of the U.S. Treasury markets.

That was possible largely

because of the redundancy built into the eSpeed network and round-the-clock recovery efforts by the remaining 300 eSpeed IT workers in London and the U.S., said Matt Claus, the company's new chief technology officer.

"The reason it was possible was because of our previous strategy to build a concurrent computing center" that mirrored all the services in eSpeed's World Trade Center facilities, Claus said.

Since February, eSpeed had been building concurrent computing capabilities at its alternate data center here. The goal was to ensure uninterrupted uptime by having all services run simultaneously at two locations linked by a high-speed fiber-optic connection.

At any given time, half of eSpeed's trading and back-office applications ran live at its primary data center in the

World Trade Center, while the other half ran live in the mirrored facility here, about 15 miles northwest. All applications running live at one location were periodically switched to the other site as part of the company's disaster preparedness exercises. Data replication software mirrored critical databases at both facilities.

In addition, eSpeed made it a point to use only 10% of the processing capacity on its servers so it could handle sudden spikes in volume, Claus said. eSpeed also used its London facilities to back up operations in New York.

So when the World Trade Center collapsed, all transactions running at eSpeed's New York facilities automatically kicked over to its sites in London and Rochelle Park, N.J.

Services to eSpeed customers in Europe and Asia were unaffected by the failure of the company's primary data center, but U.S. customers lost their connections to the eSpeed network. The attack also took down eSpeed's connections to

Mirror Image

Concurrent, fully redundant operations and mirrored storage meant that eSpeed lost relatively little data even though its primary data center was wiped out. Here's what it had to restore:

► **Connections** to its trading network for U.S.-based clients

► **Trade settlement services**

► **Data and system software** on all servers destroyed in the World Trade Center attacks

► **More than 300 servers**, as well as routers, networks and storage equipment

banks, making it impossible for the company to settle and fulfill trades. Also destroyed were millions of dollars worth of servers, storage hardware and networking equipment.

One of the immediate tasks was to restore the company's trade settlement ability. A decision was quickly made to

outsource the function to Automatic Data Processing Inc. (ADP) in Roseland, N.J. Under that plan, eSpeed would send the output of its trading system to ADP through dedicated lines. ADP would then handle the fulfillment function.

The decision meant having to integrate eSpeed's trading systems with ADP's settlement systems within 48 hours. "We had never worked with them before, but we were able to leverage our development staff in London to work with ADP in designing and architecting a way for us to transmit data to ADP's systems," Claus said.

In less than two days, the teams in Rochelle Park and London also reconfigured U.S. customers with eSpeed's networks in London.

Despite the enormity of Cantor's losses, its fate on the IT front was similar to other financial services firms. Because of business and regulatory requirements, most affected companies had redundant architectures. "In most cases, the disaster recovery measures worked very well," said Larry Tabb, an analyst at Tower Group in Needham, Mass. ▀

Quick Link

For a closer look at the human element, please visit our Web site.

www.computerworld.com/q/25711

Congress Studies Sept. 11 IT Volunteer Successes, Misfires

Officials call for database of resources

BY PATRICK THIBODEAU
WASHINGTON

Within hours of the Sept. 11 terrorist attacks in New York, volunteers — individuals and corporations alike — began to step in with technology, services and sheer brainpower to lend any help they could.

But the effort lacked coordination. Intel Corp., for instance, immediately sent equipment and staff to New York and found good use for them,

providing what was described at a congressional hearing last week as "accidental leadership."

"There were lots of people that wanted to help; they just didn't know what to do," said Julie Coppernoll, an Intel executive involved in the effort. Intel filled a vital role by quickly establishing round-the-clock Internet access at the Jacob Javits Convention Center, where search-and-rescue teams were stationed. But not all attempts

to offer help were successful or even needed.

Some firms offered technology that "was not exactly state of the art," said Joe Allbaugh, director of the Washington-based Federal Emergency Management Agency (FEMA). Relief officials received excess or discontinued items "that some companies, quite frankly, just wanted to get out of their inventories," he said.

Lawmakers and federal officials are dissecting the IT industry's response to the attacks to see what can be done to improve the government's ability to make use of the nation's large reservoir of equipment and talent, volunteered or otherwise, on a moment's notice.

What's needed, said Allbaugh, is a centralized data-

base of technology resources that FEMA and other government agencies can tap.

"There are so many companies out there, it's confusing to know exactly who to go to for what particular problem," he said. "So providing that database immediately is more important than having the warm bodies at the site."

Sen. Ron Wyden (D-Ore.) is chairman of the Senate Commerce Subcommittee on Science, Technology and Space, which is spearheading the investigation. He has proposed the creation of a National Emergency Technology Guard — a "talent bank" or technology equivalent of the National Guard, filled with experts who could quickly provide help when needed. People would be

called on "not just to fix what's broken, but to create whatever systems are needed most," Wyden said.

Wireless pioneer Craig McCaw, chairman and CEO of Eagle River Inc. in Kirkland, Wash., a firm that invests in telecommunications services, is a proponent of the development of such an organization.

The government needs a vehicle to quickly reach talented IT professionals in times of need, McCaw said. Previously, it could rely on large corporations in times of crisis. But that's no longer the case, he said.

"The Internet empowered individuals, and what we have is an economy composed of highly capable individuals... without the central core structure of a huge corporation," he said. ▀

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BRIEFS

Burger King Builds New Storage Network

As part of its continuing separation from London-based parent company Diageo PLC, Burger King Corp. has built a storage-area network to enable data mining and to help reduce the number of its servers by 25%. Burger King CIO Rafael Sanchez said the Miami-based fast food chain replaced server-attached storage devices with a switched architecture and disk arrays from EMC Corp. in Hopkinton, Mass.

HP, Compaq and Sun Eye Server Blades

Hewlett-Packard Co. announced plans to ship a high-density blade server based on Intel Corp. microprocessors next month for uses such as Web hosting and file storage. Prices start at \$9,450, HP said. Compaq Computer Corp. responded by saying that it will also release a blade device next month, and Sun Microsystems Inc. said it plans to release a similar system during the second half of next year.

Compaq Readies New Management Tools

Compaq said it plans to start selling new server-management tools early next year as add-ons to the software that's bundled for free with its ProLiant systems. The optional packages will be a key technology for the upcoming server blade devices. They will include tools supporting remote server deployment, resource allocation and remote systems management, Compaq said.

Short Takes

Twenty IT vendors set up a Mercer Island, Wash.-based organization called the SERVICE AVAILABILITY FORUM that will try to improve the reliability of networks. . . . CISCO SYSTEMS INC. announced new optical networking products aimed at use in metropolitan-area networks.

Feds Boost Online Surveillance Activity

Efforts to ferret out sleeper cells raise civil liberties concerns, say experts

BY DAN VERTON

SIGNIFICANT changes are under way in the federal government's war on terrorism, including unprecedented electronic surveillance measures designed to uncover terrorist cells in the U.S.

FBI officials have acknowledged that the agency is developing a combination computer worm/Trojan horse called Magic Lantern that's designed to capture keystrokes on a target computer and encryption keys used to conceal data.

The increased focus on domestic surveillance and cyber-intelligence tools comes as the war on terrorism enters a new phase designed to ferret out sleeper cells — small groups that live legally in the U.S. for years poised to conduct terrorist attacks. The Justice Department has called increased electronic surveillance of suspected terrorists a must-have capability. But some experts worry that the new focus may not produce desired results and that it poses a threat to privacy and other civil liberties.

Spy Tools Could Be Useful

"To the degree there are any al-Qaeda sleeper cells here, they do use the Internet to communicate frequently," said Vince Cannistraro, former director of counterintelligence at the CIA. "They also encrypt their messages. So surveillance tools are potentially useful if the FBI knows what it is looking for and knows where to look. That, of course, is a big if."

"I am very concerned about

civil liberties at this point and certainly about increased penetration of online activities," said Steve Kobrin, a professor of multinational management and an online privacy expert at the Wharton School of the University of Pennsylvania in Philadelphia. "The odds that our privacy is being invaded by the U.S. [government] have certainly gone up, and the odds that we will ever know about it have gone down."

Phil Zimmermann, inventor of Pretty Good Privacy encryption software, said that although there was an initial

push by some in Congress and the White House to clamp down on encryption exports in the aftermath of Sept. 11, he doesn't foresee a change in U.S. policy on that front.

Zimmermann also said the government won't insert back doors in commercial software. "We've already won this battle," he said.

But concerns about other measures linger.

"The availability of new surveillance technologies and the government's eagerness to employ them certainly do pose a challenge to traditional civil liberties," said Steven Aftergood, director of the Project on Government Secrecy at the Federation of American Scientists in Washington. "There is

Two Research Funding Bills Gain Ground in Congress

Focus on security, global competition

BY PATRICK THIBODEAU
WASHINGTON

Concerns about terrorism are partly responsible for a new push in Congress to pump millions of dollars into IT research, especially for information security. But corporate technology managers won't see overnight benefits from this funding, if it's approved.

The White House hasn't specifically endorsed the two funding bills from the House Committee on Science, one of which would boost IT research spending by 46% to \$7 billion over five years, but the plan was developed with input from cybersecurity czar Richard Clarke.

"The government can do research — research into new ways of doing security," said Clarke, a special adviser to the president on cyberspace security, at an industry forum last week. "[But] the government shouldn't do it alone. Industry should invest in IT security."

"We need to keep the private sector in partnership with the government so that the government dollars for research are placed in areas where the private sector is not already, through market forces, engaged," he added.

Private-sector companies largely focus on short-term, product-related security research, Clarke said. The federal money, by contrast, would be directed toward basic and applied research projects that could take years to develop.

Industry experts said this

Special Spending

The Bush administration's 2002 budget for T-related law enforcement projects includes the following:

\$10 million to fight cyber-crime and enforce intellectual property laws.

\$9.2 million to the DOJ for computer equipment, forensic research tools and a background-check system for the National White Collar Crime Center.

\$1.5 million to the National Center for Rural Law Enforcement Technology for facial-recognition devices.

some danger that the surveillance impulse will take on a life of its own, producing an unwholesome mutation of our political system." ▀

funding could address looming security concerns.

"Wireless systems right now have a great lack of security, and they're going to be ubiquitous in the next five to 10 years," said Lance Hoffman, a professor of computer science at The George Washington University in Washington.

But the U.S. also needs to boost IT research in high-end computing to remain competitive, said experts.

For example, European and Japanese automakers are using high-performance computing in their development programs. Using modeling and simulation, they aim to design vehicles that can operate without repair for 150,000 miles. Their goal is to leapfrog ahead of the U.S., said Earl Joseph, research director of high-performance systems at IDC in Framingham, Mass. "The U.S. companies are so far away from this, it's ridiculous," he said. ▀

Quick Link

For more information about the FBI's cybersecurity moves, visit our Web site:

www.computerworld.com/q725707

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For more IT policy coverage, visit our Watching Washington page:

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Content Delivery Networking Shows Up in Corporate Apps

Users say technology saves bandwidth and reduces need to add remote servers

BY JAMES COPE
SAN JOSE

CONTENT DELIVERY networking (CDN) and caching technologies, which up to now have been aimed primarily at speeding the downloading of Web pages by Internet users, are starting to stake out a place in corporate applications.

The trend remains in its infancy but is real, according to users and analysts who attended the CDN Fall 2001 conference here last week. CDN setups give IT managers a way to improve network availability and throughput without adding more bandwidth or buying lots of new servers, said Michael Alban, strategic alliance manager at Malvern, Pa.-based Siemens Medical Solutions Health Services Corp.

CDN devices identify and store frequently used files on data caching servers located outside a data center — at the edge of a LAN, for example. The idea, conference attendees said, is to make the information more readily available to end users while mitigating the load on data center servers and wide-area networks.

Fueled by New Apps

Corporate interest in CDN equipment is being fueled by new Web-based applications such as video streaming, voice over IP and IP-based virtual private networks, said Cindy Borovick, an analyst at IDC in Framingham, Mass. At the same time, she added, vendors are offering content-routing

technologies, designed for enterprise uses, that are capable of doing intelligent routing at gigabit-per-second speeds.

Alban said Siemens Medical Solutions, which sells software to health care providers, turned to CDN after running into problems when it added a Java-based client to a clinical and patient information application that it offers to customers on a hosted basis.

The application is used by about 50 companies, Alban said that using traditional technology to refresh the 2MB Java client applet on PCs would

have required Siemens to upgrade its WAN and install up to 18 new servers — at a cost of \$900,000 for the servers alone.

Instead, Alban said, Siemens installed CDN devices made by Cisco Systems Inc. in its main data center and on customers' LANs. The Java applet is renewed from local caches on the Cisco units, which speeds updates and cuts recovery time if servers fail, he said.

The CDN devices weren't cheap: Alban said they cost \$15,000 to \$20,000 each, putting the total hardware investment at close to \$1 million. But Siemens had to add only three new servers to its network and has been able to increase availability of the application from 90% to 99.98%, he said.

Jarad Carleton, an analyst at San Antonio-based Frost & Sullivan, said he expects that streaming multimedia content over WANs for uses such as corporate training will be a big driver for CDN, particularly among large companies.

GSD&M Advertising, an ad agency in Austin, Texas, is an example, Jerry Rios, chief technology officer at GSD&M, said it just started using technology from Volera Inc. in San Jose to speed the transfer of video files, including video e-mail messages and TV ads that are under development, between company headquarters and a regional office in Chicago.

Rios said he has been using Volera's basic CDN application for about two years to speed up

Delivery Time

Users and analysts said CDN technology can provide the following benefits:

- Local caching of data reduces the number of application servers and the network bandwidth that companies need to install and manage.
- Users in remote offices can get faster access to cached content without tying up WAN performance.
- Application availability can be increased by better balancing user demand for data, and recovery time when systems crash can be lowered.

Internet access for GSD&M employees. The cost for the servers and software was about \$25,000, which he said was cheap compared with the other option of going from a T1 to a T3 line at a cost of \$9,000 per month.

Rios said the new multimedia application cost the agency an additional \$26,000. ▀

Continued from page 1

Enron Rivals

wading through a backlog of 1,000 new inquiries, said Marcial.

The help desk started performing 30-to-60-minute monitoring checks on ICE's production systems so that IT executives could stay on top of the boom. Marcial said his staff is now thinking about systems capacity in terms of weeks rather than months or years.

"Everybody's on a little alert state," he said.

ICE has already added 10 Windows 2000 servers to its online trading operation and accelerated an upgrade of its virtual private network server, according to Marcial.

"We had the job scheduled for the end of December, but we were running out of capacity and decided to move the project up," he said. "Now, we can scale to 10,000 concurrent users."

James Walker, an analyst at Forrester Research Inc. in

Cambridge, Mass., said ICE has so far gained the lion's share of online energy trading volumes.

"ICE is the multiparty exchange now," he said.

Yet Enron, which ranked seventh in the Fortune 500 prior to its collapse and Chapter 11 bankruptcy filing, had been handling more online energy trading than any one company could hope to instantly absorb.

"We have seen trading volumes increase dramatically" as a result of the shift from EnronOnline, said Matthew Claus, CTO at eSpeed Inc., a New York-based online marketplace that was spun off by bond-trading firm Cantor Fitzgerald LP and whose interests include the TradeSpark LP energy exchange. But so far, eSpeed has had the server capacity needed to handle the increased traffic, Claus said.

Hedging Bets

At Chicago-based Exelon Corp., risk exposure has been a big topic of conversation since Enron's woes became public known this fall, said Michael Erdlen, vice president of IT for

the company's power production and wholesale marketing unit in Kennett Square, Pa.

But in the same way that businesses examined their disaster recovery systems after the World Trade Center attacks, energy firms are making sure they're not putting too much faith, or business, in any one company, even a giant like Enron, Erdlen said.

"It just brings more scrutiny on [risk]," said Erdlen.

Walker noted that rival exchanges "got started in the first place because users wanted to spread the risk around." That strategy proved fortuitous when traders began to flee en masse from EnronOnline two weeks ago.

Chad Ferguson, an Indianapolis-based trader for the Wabash Valley Power Association, began trading on ICE two weeks ago, before he stopped trading on EnronOnline.

"We were pretty active in using EnronOnline and trading with Enron directly," he said. "It's definitely hindered us not having Enron out there." That's because trading partners have

scattered to the winds and there hasn't been as much liquidity on other online exchanges as there once was on EnronOnline, Ferguson added.

Ferguson plans to spread his trading among ICE, Houston-based Dynegy Inc. and traditional broker markets like the Chicago Board of Trade.

He said the transition to new exchanges hasn't been difficult from an IT standpoint, but traders need to get used to the different screens and trading processes. Ferguson added that, while ICE had been very active, it likely won't woo the breadth of customers that Enron boasted in its heyday.

"Some of the smaller players that have been using Enron, they don't have the credit and contracts in place where they can make this sort of change quickly," he said. ▀

Reporter Jaikumar Vijayan contributed to this story.

Quick Link

Online video seller iFilm says it's easier to rent a CDN architecture than to buy one.

www.computerworld.com/q725706

Quick Link

Companies that had contracts with Enron are left with lingering questions.

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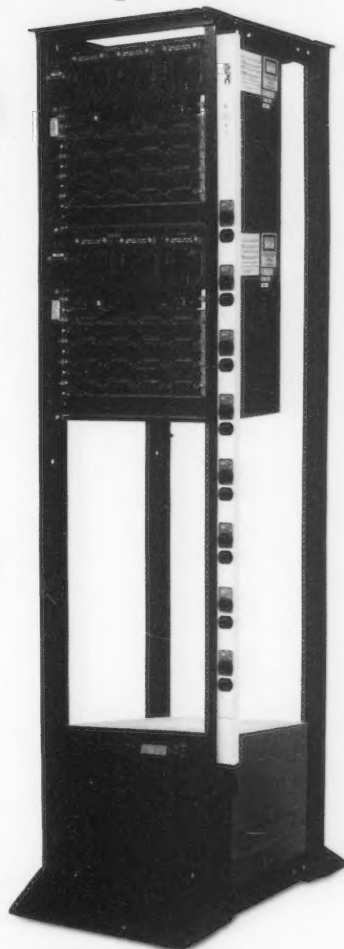
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New Stock Exchange CIO Pushes Disaster Recovery

*Boston trading operation builds new network,
looks to expand backup and hot site capabilities*

IN SEPTEMBER, Boston Stock Exchange Inc. named **Mike Curran** as its first CIO, with responsibility for managing an increasing number of technology projects focused on disaster recovery and customer services. Curran, who previously was chief operating officer of the international business unit at New York-based Zurich Scudder Investments Inc., spoke with *Computerworld's* Lucas Mearian last week about his first few months on the job.

Q: Why did the exchange decide to create a CIO position?

A: The number of projects and the strategic role that technology is going to play at the exchange going forward made it necessary. Ken Leibler is the new chairman of the exchange. He came here in February. And I believe from the outset, as he looked at where the exchange needed to go, a key part of his thinking was technology and the role it would play in the future.

Q: Having come on the job a week before Sept. 11, what issues have you faced?

A: My first month on the job [was] pretty intense. The exchange has always had a backup and recovery site in Woburn, [Mass.]. ... But I think everyone in the business community today, and especially in financial services, has to take a renewed perspective on disaster recovery. We're taking our backup and recovery [efforts] to a higher level of readiness in the next six to nine months.

Q: What will that entail?

A: You have to make sure your people have a good communications plan in hand in the event that some circumstance occurs. To some extent, disaster recovery preparation is more important than a disaster recovery plan, which is something you take and pull out when the event occurs. We're also going to need to go to an almost fully hot site with the ability to switch everything that happens here [in Boston] to Woburn, or vice versa. And that's a whole

new way of looking at things [for us].

Q: What new technologies will help you do that?

A: We had to roll out a wide-area network, which we didn't need before, because the systems were local-area networked to the [trading] floor. We're into a whole new level of Cisco technology. ... And even now, having rolled the network out, we're just implementing some of the net-



CURRAN: Prioritize IT projects before taking them on.

work management software [and] hiring some of the critical skills to support that initiative. We also have another project related to that. We're completely rebuilding our firewall.

Q: What's the biggest challenge for a CIO in this economic environment?

A: Obviously, the economics of the business world have changed. There are the same issues you had before; you just need to sharpen the pencil a little bit more. You have to prioritize whether [IT projects] are really key, important initiatives and whether the benefits are there for taking them on. ▀

EAI Vendors Embrace Web Services

*Could simplify projects,
but tools must mature*

BY MICHAEL MEEHAN

Although most users aren't adopting Web services yet, enterprise application integration (EAI) vendors are building support for the technology into their software in an effort to reduce the complexity of integration projects.

Palo Alto, Calif.-based Tibco Software Inc. last week announced an EAI tool that supports Simple Object Access Protocol messaging and the Web Services Description Language, plus technologies such as Java and XML. Tibco is aiming the new package at users who want a simplified way to tie different systems together.

Tibco's rollout followed a similar move two weeks ago by webMethods Inc. in Fairfax, Va., and announcements earlier in the fall by Vitria Technology Inc. in Sunnyvale, Calif., and SeeBeyond Technology Corp. in Monrovia, Calif. The new capabilities let IT departments use Web services technology instead of EAI adapters that have been developed for individual applications.

Such moves are supposed to simplify the notoriously complex task of doing

EAI implementations, and some early users are starting to turn to Web services as part of integration projects [*News*, Oct. 22].

Eric Austvold, an analyst at AMR Research Inc. in Boston, said the relatively simple connectivity of Web services is a natural fit for EAI uses. "But the vendors are out ahead of the users right now," he cautioned. "This is a baby who's just crawling."

In addition, software vendors haven't agreed on operational standards for Web services, Austvold said. Java 2 Enterprise Edition, which lies at the heart of most application servers, also hasn't been tied to Web services, he said.

Cost-Effective, Eventually

Tyler McDaniel, an analyst at Hurwitz Group Inc. in Framingham, Mass., said Web services should eventually prove to be a more cost-effective way to integrate incompatible systems. "The best part about it is, it's not technology that disrupts the way a company does its work," he said.

Like Austvold, though, McDaniel recommended a cautious approach at first. "You probably don't want to try this on your more mission-critical projects until the market has time to mature," said McDaniel. ▀

INTEGRATION



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BRIEFS

Comdisco Plans 10% Workforce Reduction

Comdisco Inc., which is in the midst of bankruptcy proceedings, set plans to cut its workforce by 10% during the next 60 days. The Rosemont, Ill.-based technology services vendor said 128 employees were notified last week that they will be laid off as part of the cutbacks. Comdisco added that it's hoping to emerge from Chapter 11 bankruptcy protection in the first half of next year.

VeriSign to Offer Domain Name Service

Mountain View, Calif.-based VeriSign Inc. said it's buying two small companies that offer domain name management services to corporate users. The acquisitions of 1GlobalPlace Inc. in El Segundo, Calif., and Name-Engine Inc. in New York are part of VeriSign's plan to set up a new unit that will provide services for registering and protecting domain names and corporate trademarks.

Sybase Predicts '02 Revenue Growth

Sybase Inc. forecast that its revenue will increase by about 5% next year despite expectations that IT spending as a whole will only rise by a minimal amount. Emeryville, Calif.-based Sybase also predicted a 10% increase in its earnings next year on a pro forma basis. The database and tools vendor reported a small decline in revenue for the first three quarters of this year.

Short Takes

Santa Clara, Calif.-based NETWORK ASSOCIATES INC. named Gene Hodges its president and said Steve Richards, who currently heads finance, will become chief operating officer. . . . Ottawa-based COREL CORP. said it expects a loss of up to \$31 million (U.S.) in the fiscal year that started Dec. 1.

PeopleSoft Seeks to Narrow CRM Gap

Upcoming software upgrades aim to match market leader Siebel's technology

BY CRAIG STEDMAN
BOSTON

PEOPLESOFT INC. is planning to ship two upgrades of its customer relationship management (CRM) software during the next four months in an effort to match market leader Siebel Systems Inc. on functionality.

PeopleSoft got into the CRM market by acquiring Vantive Corp. early last year. This past

June, it released a Web-based version of Vantive's applications as part of its PeopleSoft 8 product line. Now Pleasanton, Calif.-based PeopleSoft is looking to put itself in a better position to compete head-on with Siebel, Oracle Corp. and SAP AG for CRM installations.

Rick Bergquist, PeopleSoft's chief technology officer, acknowledged that analysts have identified some areas in which the company's CRM applica-

tions fall short of San Mateo, Calif.-based Siebel's technology. But once the two promised upgrades ship, he said, "we don't think we'll have any large competitive gaps out there."

At a customer event here last week, Bergquist said PeopleSoft plans to ship an initial CRM upgrade late this month, with more flexible relationship and data modeling capabilities and other new features. A more substantial upgrade will follow in March (see chart).

PeopleSoft said 125 customers have bought the CRM software since June and about 10 of those companies are ac-

Humbled Cisco Focuses on Business Basics, Not Growth

CEO still predicts market share gains

BY JAMES COPE
SANTA CLARA, CALIF.

At Cisco Systems Inc.'s annual conference for financial analysts here last week, CEO John Chambers characterized this year as a humbling experience for the networking giant.

Cisco is still confident that it's gaining market share from competitors, Chambers said. But the extent of the ongoing economic slowdown was unforeseen by company executives and has forced Cisco to "go back to basics," he added.

That means concentrating on improving cash flow, profits and employee productivity, Chambers said. He didn't mention the 30% growth in annual revenue that Cisco has traditionally touted as an achievable goal.

"[Business] visibility is tight," Chambers said. "We're going to

focus on the available market."

That conservative approach reflects the ongoing sales slump that hit Cisco early this year and has prompted layoffs and other cost-cutting moves (see chart). The company reported a \$1 billion net loss for the fiscal year that ended in July and then announced a \$268 million deficit for its first quarter ended Oct. 27.

Orders thus far are meeting expectations in this quarter.

However, as the large corporate users who are Cisco's bread-and-butter customers struggle to cope with the economic downturn, convincing them to buy networking equipment hinges on showing how those investments will increase their productivity, Chambers said.

Galen Schreck, an analyst at Cambridge, Mass.-based Forrester Research Inc., said Cisco should be able to increase its enterprise-level market share even though its sales have been declining on a year-to-year basis. Corporate users "are looking for a stable vendor that won't leave them high and dry," Schreck said. ■

Cisco's Struggles

The networking vendor is trying to cope with a sharp drop in sales that has led to the following:

- ▶ **Net losses** during the company's past fiscal year and its first quarter ended Oct. 27, the latter accompanied by a 32% drop in revenue from the year-earlier period.
- ▶ A sweeping **corporate reorganization** four months ago, in addition to cutbacks that included an 8,500-worker layoff and massive inventory write-downs last spring.
- ▶ A **strategic focus on technologies** such as voice-over-IP telephony and metropolitan-area networking for future sales growth.

AT A GLANCE

Upgrade Plans

The CRM software releases being developed by PeopleSoft will include the following:

VERSION 8.1: Due late this month with enhanced relationship and data modeling tools, features tailored for financial services firms and support for integration with Microsoft Corp.'s Outlook e-mail software.

VERSION 8.4: Scheduled for release in March with Web-based client software for mobile devices, functionality geared toward additional vertical industries and a module for tracking software defects.

tively using the application.

The Thomson Corp.'s Thomson Financial subsidiary is one such user. Toronto-based Thomson Financial's portfolio solutions group, which develops investment management and accounting software, rolled out some of the PeopleSoft 8 CRM applications for 160 employees earlier this year in the first phase of a project that could eventually involve 2,000 end users.

Craig Berkson, CIO at the portfolio solutions unit, said PeopleSoft's Web-based client software significantly reduces desktop support issues because no code needs to be installed on PCs. But Berkson added that there are some functional differences between PeopleSoft 8 CRM and the last release of Vantive's applications, which he had initially installed at one division.

For example, Berkson said, the PeopleSoft 8 product has less-sophisticated relationship modeling capabilities because it was based on an earlier Vantive release. As a result, he said, users may have to customize the software in order to set up a real-world data model.

Tim Getz, an analyst at Prudential Securities Inc. in New York, said PeopleSoft is still in the early stages of its CRM strategy and doesn't have the same breadth of functionality that Siebel does at this point.

But Getz estimated that PeopleSoft has been able to increase its customer win rate against Siebel from less than one in five users to about one in three since PeopleSoft 8 CRM became available. ■

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MARYFRAN JOHNSON

Mission-Critical Web

BANK ONE CORP. MADE front-page news last week with its startling announcement of plans to hire 600 IT professionals in the next two years. But it wasn't the number of jobs that was so encouraging during these dark days for the national economy. It was the loud-and-clear leadership signal the Chicago-based bank sent about Web infrastructure development as the next wave of mission-critical IT.

CIO Austin Adams is using his \$2 billion annual budget to dramatically reset the bank's IT priorities so that it regains control of what matters most and translates in-house expertise into better customer service. Instead of relying on 800 to 900 contract IT workers and a half-dozen service providers, Bank One will gradually replace the outsiders with its own IT project managers, senior engineers, systems architects and Web developers. The goal is to pull six deposit and online banking platforms in-house, building a single platform that will give customers a consolidated view of their business with the bank.

The lousy economy is lending a hand to Bank One's efforts by serving up the best employer's market for IT talent in the past decade. And by virtue of who signs their paychecks, these new IT employees will have the bank's future at the top of their priority lists. They'll have a greater motiva-



MARYFRAN JOHNSON is editor in chief of *Computerworld*. You can contact her at maryfran.johnson@computerworld.com.

tion to truly understand the business. They'll have a deeper understanding of their own IT infrastructure and how well it integrates with the Web. And these skill sets aren't commodities. They can't be checked off the requirements list in an outsourcing contract.

When we recently evaluated the hottest job skills ["Hot Skills for a Cold Market," Nov. 12, www.computerworld.com/q?24559], it was obvious that the business universe is increasingly Web-centric. Companies need IT people who know Web development tools, XML, Java and C++. Demand remains highest for skills in TCP/IP networking, security, business continuity, and a host of Web technologies.

Yet for the past few years, many companies have considered it a no-brainer to hand off all manner of Web work to outsourcers, service providers and consulting firms. The e-business side of the house was considered high-potential but not quite mission-critical. That's changing. Right now. Right quick. Is your company ready?

PIMM FOX

Custom Apps Still Bane of App Servers

APPPLICATION SERVERS SUCH AS WebLogic from BEA Systems and WebSphere from IBM are all the rage. They offer scalable resources with the ability to reuse custom code. Typically, app servers provide the intermediate layer necessary to interpret Java code so applications can run across different platforms.

And they've matured, from running general e-business software for runtime services, load balancing and security to more complicated interactive Web functions like middleware and personalization programs. Previously, most of the app server work was done with Perl and CGI scripting that had to be redone each time a new iteration of the application was introduced. But the advent of J2EE offered hope for an easier way to produce and deploy custom applications.

So much for hope.

App servers demand custom Java applications that require expert — and expensive — programmers who can translate business requirements into a detailed design. "This stuff is darned difficult to do," says Michele Rosen, an analyst at IDC.

But there are a couple of ways to tackle the problem.

First, you can forget about it and choose a well-defined application (such as Blue Martini Software's CRM software) designed to run on app servers. But like any packaged solution, this constrains users who have installed custom applications or who have special requirements that make a custom application compelling.

Another approach is prepackaged custom components such as Enterprise JavaBeans — basically little bits of code — that do a general-purpose task. In this scenario, you knit together components to build an application. "Perhaps you only have to write 20% of the custom code necessary to build a real application," says Rosen.

But it's hard to write a component general enough to be used in multiple situations and still be useful. Many developers will decide it's easier to start from scratch and roll their own code.

Another way to tackle Java complexity is to draw



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a model of your application, using diagrams to link data. The code is then generated behind the scenes. Termed *business process automation*, this is the path companies such as Secant Technologies and Versata Inc. have mapped out. It's fundamentally a top-down approach, says Rosen, in which the business analyst models the concept and the software writes the code in the background, reducing the need for Java programmers.

The caveat is that even if you can get 100% of what you want modeled, the automatic coding will fall short and custom work will be necessary.

App servers still have great promise, but they aren't a nostrum to building custom apps. ■

DAVID MOSCHELLA

Recession Won't Erode Business Confidence in IT

IT'S NOW OFFICIAL. The nonprofit National Bureau of Economic Research says that the longest U.S. economic expansion since records were first kept in 1854 is finally over. In fact, the expansion is officially deemed to have ended in March. Like we didn't know.

The technology business has been struggling since the Nasdaq bubble burst way back in March 2000. For the national economy, the whiff of recession has been noticeable since before last November's presidential election. During the course of this year, countless companies have had to lay off workers or put the brakes on important projects, especially since Sept. 11. No one doubts we're in a recession. Saying that it began in March is just a stake in the ground that economists have to stand

behind now and again. They know better than anyone how debatable any specific date can be.

For the IT industry, the key question in any recession isn't how long it will last, but whether it will fundamentally shake the confidence of the times. To appreciate this, just think back to the last recession, in 1991.

Things seemed bad a decade ago, but America's boom times since then lasted so long that you have to work hard to conjure it up. At that time, the Japanese and German economic machines seemed unbeatable; America appeared addicted to its twin deficits of budgets and trade; and it was commonly said that decades of heavy spending on

IT had yet to deliver any clear competitive payoff.

This last point is the key. Since the return on IT investments has always been hard, if not impossible, to measure, business attitudes toward IT tend to vary depending on the spirit of the times. When the U.S. economy was down, the fact that we spent more on IT than other nations was used to argue that IT investments weren't paying off. When U.S. prosperity returned in 1992, IT was given much of the credit. In fact, I would argue that the initial excitement over the Internet was greatly amplified by the fact that it arrived in 1993 and 1994, just when renewed faith in the value of IT was starting to surge. Had the Net arrived a few years earlier, the reaction might have been considerably more muted.

So the question today is whether business confidence in the overall value of IT has been funda-

mentally shaken. The answer is almost certainly no. The simplest explanation for this underlying faith in IT is that no other major developed nation or region appears to be gaining at our expense, certainly not our traditional rivals of Germany, Japan and the tigers of Southeast Asia. As long as the U.S. sees itself as being significantly stronger than its main economic rivals, IT will continue to get much of the credit, and business confidence in IT therefore should hold relatively firm.

Of course, no one can predict how long any recession will last. All we can reasonably say is that as long as companies and their leaders remain confident in the benefits of IT, our business should fare no worse than other major economic sectors, and probably a good bit better. After 10 years of sustained double-digit growth in IT spending, that's about all any industry can ask for. ■

READERS' LETTERS

H-1B Visas Not Needed

THE H-1B program is also known as the high-tech guest worker visa program. Enacted in 1990, it was fashioned around a presumed shortage of technical workers, including programmers. There is no such shortage, and the ICCA feels that the H-1B program does not provide adequate safeguards for U.S. workers. According to the agreement, H-1B visa limits have been raised from 65,000 in 1997 to 85,000 in 1998, 95,000 in 1999, 105,000 in 2000, 115,000 in 2001 and 195,000 in 2002. The ICCA feels that the increase for H-1B work visas is too large, extends for too long a period and provides worker safeguards that are too lax to prevent harm to our high-tech workforce and the long-term vitality of the U.S. technical infrastructure. We feel that the H-1B program leads to rampant fraud and abuse, primarily by foreign recruitment agencies that bring H-1B workers to the U.S. It violates the principles of a free market by giving advantages to a non-native population. The ICCA

believes that these abuses are well known internally within our industry. The U.S. job market for technical professionals is softening. In the last few months, technology companies have cut more than 150,000 jobs, and the unemployment rate for technical professionals has nearly tripled. The ICCA advises Congress to repeal the H-1B program or its application to technology workers and programmers.

Joyce Burkard
Executive director/officer
Independent Computer
Consultants Association
St. Louis

to Americans with respect to jobs is not unreasonable. These types of preferences exist in virtually every country. People who used the H-1B visa as a means of entering the U.S. were well aware of its risks. Thus, having to return to one's country shouldn't be considered a hardship. Despite the absurdity of many of the rules that underlie U.S. immigration laws, we have one of the most liberal attitudes toward immigrants in the world.

Jerrold P. Katz
J.P. Katz & Associates LLC
Auburndale, Mass.

Competitive Reality

ONE ITEM always seems to be overlooked in the IT productivity question ["Fighting McKinsey," Business Opinion, Dec. 3]. One reason companies don't see the full benefit of IT productivity increases in their bottom lines is that their competitors are also investing in IT. As your operations improve, so do those of the competition. Without competition, lowering your costs allows you to have fatter profit margins. But with

competition, lowered costs allow you to lower prices or improve services and remain competitive at the same profit margin. A business that fails to invest in IT will put itself at a competitive disadvantage to others that do invest in IT. For instance, Wal-Mart may spend a lot of money on data warehousing and sales and inventory tracking, but so do Kmart and Target. If Wal-Mart wants to stay on top, it needs to keep pushing its IT infrastructure. Technology fuels an arms race as businesses invest in improvements just to maintain the status quo.

Andy Welter
Senior computer consultant
Dayton, Ohio

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DAVID MOSCHELLA is an author and independent consultant. Contact him at dmoschella@earthlink.net.

JOAQUIN ABREU had braced himself for a grueling fourth quarter. By the end of this year, he plans to have more than doubled the staff at Coral Gables, Fla.-based Set-Net Corp., adding 60 workers to the wireless software company's staff of 40.

With all the out-of-work dot-comers, the task might seem easy. But Abreu says he's learned that it takes approximately 100 résumés to produce one good candidate.

"We seek a pretty unique skill set," says Abreu, a software-developer-turned-marketing-manager at the 2-year-old company. "Our ideal candidate will understand the software world as well as the telecommunications world. It's hard to find someone that understands both environments."

Although the wireless world is surrounded by hype and alive with growth potential, the hiring picture is decidedly mixed. Some companies such as SetNet — which develops uni-

fied communications software for wireless communications companies — are well positioned to hire. But they seek such specialized skills that the now-plentiful pool of programmers yields few viable candidates.

Other companies are sitting on the sidelines drooling over potential hires but unable to take advantage of the supply. The reasons: Demand for wireless grows at a snail's pace, and protocols are still under development.

The largest cluster of jobs is at companies that develop wireless products and software and create customized applications for firms that are adopting wireless devices. But there are also a limited number of jobs at companies that are adding wireless programmers to their IT departments to write applications in-house.

"Wireless is hot," says Joe Koscik, CEO of Management Decisions Inc., a Norcross, Ga.-based recruiter. "But the demand is all on the voice side," he adds, noting that the failure of one "killer app" to emerge on the data side

WAYNE FLEMING of Optimus Solutions: "We're finding that the people we interview are skilled in one area of mobile and wireless but not in others, and we want our resources to do more than just one thing."

While the overall hiring picture is mixed, wireless professionals who boast strong business and communications skills are in high demand everywhere. By Michelle Bates Deakin

Wanted: Wireless Know





v-It-Alls

is hindering industry growth — and therefore hiring — in that sector.

Salaries for wireless programmers can range from the high \$60,000s to \$100,000, depending on experience.

"Jumps in pay beyond that revolve mainly around the technology being used, not whether developers move into a managerial role," says Koscik. For example, greater experience in Java 2 Enterprise Edition or Enterprise JavaBeans will command a higher salary, but project managers typically earn about the same as developers, if not a little less, he says.

The languages most in demand at wireless companies are XML, Visual Basic, C++ and Java. But even more than specific skills, managers are searching for nimble minds that can adapt quickly and envision applications for the new technology.

"You have to find people who really understand what wireless is going to be," says Jim Wells, senior vice president and chief operating officer at GeePS Inc., a wireless application provider in Cranbury, N.J.

Because of the cross-industry knowledge required, one of the most fertile fields for recruiting is at wireless companies themselves, particularly those that are falling victim to the rampant consolidation in the fledgling industry.

At Optimus Solutions, also in Norcross, professional services manager Wayne Fleming tapped the staff of Crescendo Communications — just 10 miles up the road — for most of the 30 people in his department. Like Optimus, Crescendo developed wireless and mobile Web applications. However, unlike Optimus — which was recently named the third-fastest-growing private company in the Atlanta area — Crescendo is no longer in business.

Fleming began hiring Crescendo employees while it was still operating, and after the company was shuttered, he picked Crescendo clean.

Even with a plentiful source of 98 workers to choose from at Crescendo, Fleming found that he had to conduct an arduous search for skills.

"We're finding that the people we interview are skilled in one area of mobile and wireless but not in others, and we want our resources to do more than just one thing," Fleming says. Because the wireless market is ever changing, Fleming wants to hire people who are adaptable and then keep them that way. "We also hire Web developers and teach them low-bandwidth applications for small screens," he says.

Optimus conducts extensive training, both in-house and externally. Program-

Wireless Wonders

Salaries for wireless programmers vary with experience. But, as a rule, developers on the data side outpace developers on the voice side. Here are the job titles and skill sets in greatest demand:

WIRELESS VOICE DEVELOPERS
with five to eight years' experience who work in C++, Java or Unix:

MID \$80ks

WIRELESS DATA DEVELOPERS
with at least one year's experience who work with third-generation wireless technologies, Bluetooth, Handheld Device Markup Language, Data Management Language, Short Messaging Service and Global System for Mobile Communications:

\$85k TO \$95k

SOURCE: MANAGEMENT DECISIONS INC., NORCROSS, GA.

mers shadow co-workers with complementary expertise. And Fleming gives presentations on what the company can realistically deliver to customers, given the limitations of a technology that's barely out of its infancy.

At least one staff member attends a mobile and wireless conference every other month and, upon returning, makes a presentation to the rest of the staff.

"There is no one solution that encompasses everything from one vendor," says Fleming. "We try to keep on top of trends and products as they become available."

Wells says he wishes he had such problems hiring and training candidates at GeePS. Hiring plans at his 12-person wireless company, which develops applications for shopping malls and sales representatives, are on hold as it waits for growth in the demand for devices that transmit wireless data.

"We're waiting for people to begin using these devices," says Wells. But he has confidence in wireless. "It's like the Internet," he says. "Once it becomes part of the landscape, it will continue to grow and accelerate." ▀

Deakin is a freelance writer in Arlington, Mass.

CHRIS TACKE didn't set out to be a programmer. He studied to be a seismic geologist and worked in that field for five years before he found that he liked application development more than rocks. But it wasn't until he landed a job in wireless a year ago that the earth really moved for him.

"Wireless is the place to be," says Tacke, 30, a lead developer at Rubicon Technologies Inc. in Reston, Va. "It's got huge potential, and as it advances, wireless and mobile will just become bigger and bigger."

The wireless field is exploding with enthusiastic young developers like Tacke who are charting the course for new mobile and wireless products and

reveling in their career options. While their dot-com counterparts scramble to avoid layoffs and land jobs at stable companies, wireless programmers are finding comfortable salaries, riveting work and plentiful opportunities for career advancement.

Mark Scheel is another programmer who abandoned his previous aspirations after discovering wireless. "I always wanted to be a doctor, and I never thought I'd enjoy anything different," says Scheel, 26, a graduate of Baltimore-based Johns Hopkins University's pre-med program. He began working as a contract programmer after graduation.

Scheel says he enjoyed the variety of contract work but began to worry about the decline in contract opportunities. So for the past 18 months, he's

been a software engineer at Reason Inc., an Aurora, Colo.-based company that provides wireless device asset management for enterprise companies.

At Reason, the variety of Scheel's projects mirrors the breadth of his contract work. He has programmed Web sites for phones that support the Wireless Application Protocol (WAP), written custom Java programs that analyze wireless billing data for corporate customers and built Web interfaces that download information from Oracle databases into spreadsheets.

"You never get pigeonholed in wireless," says Scheel. "My role is constantly shifting, and I get exposed to new technology. The best thing about wireless is that it's an industry in its infancy."

Matt Kirkpatrick, 27, is also basking in the variety of assignments he's receiving as a senior developer at Washington-based InPhonic Inc., which creates end-to-end wireless enterprise and e-business technology.

A refugee from the e-commerce world who fled his former employer when he foresaw that company's decline, Kirkpatrick has been at InPhonic for one year. In that time, he's been involved in development work on Research In Motion Ltd. technology, WAP enablement and Short Messaging Services. He's currently working on a project to make wireless customer relationship management applications.

"Flexibility is key in wireless, because standards are emerging and there are always new obstacles," says Kirkpatrick, adding that he hopes his next career move is into management.

Unlike Kirkpatrick, Tacke eschews climbing the management ladder, at least for now. He says he's relishing the chance to have so much hands-on involvement in development for Rubicon, which creates mobile and wireless applications for enterprise companies.

Tacke spends a lot of time mentoring other Rubicon developers, particularly

Landing The Job

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KEEP UP.

Many wireless manufacturers provide software development kits on the Web. It's a valuable way to learn the functions programmers need to know for different wireless devices.

MARK SCHEEL,
a software engineer
at Reason, says
he enjoys working
in wireless because
"my role is constantly shifting,
and I get exposed
to new technology."



With huge demand and bigger potential, wireless is attracting new talent from inside and outside the IT ranks. By Michelle Bates Deakin

Woored to Wireless

Deakin is a freelance writer in Arlington, Mass.



WHEN FAILURE IS NOT AN OPTION

With 15 years of advancements in data protection and recovery, it's no wonder IS/IT managers prefer DLTape™ technology 5:1. Ultra-powerful Super DLTape™ products are available as stand-alone, autoloader, library, array and SAN solutions. To find a dependable backup solution sure to match your company's needs, go to www.superdlittape.com.

DURING TAXI RIDES, at the airport, even while suffering through the lulls of overlong meetings, Guy Abramo reads e-mail.

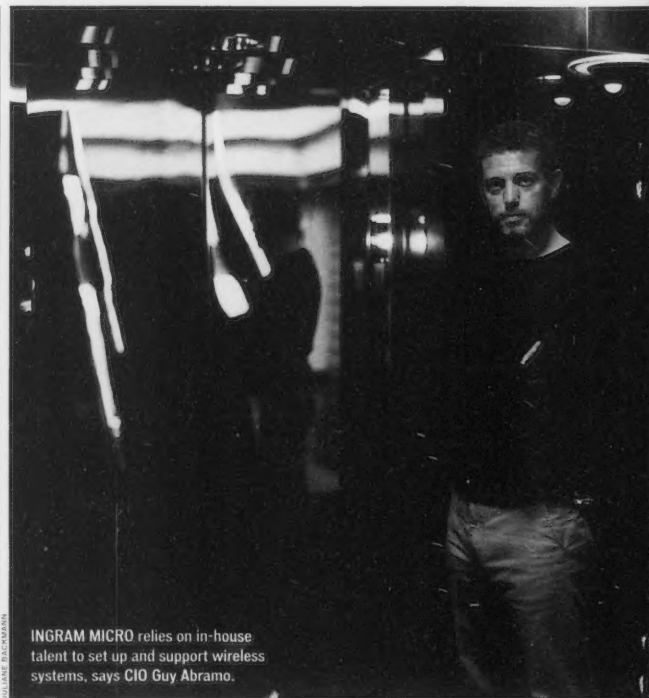
Like a growing number of executives, Abramo, chief strategy and information officer at Ingram Micro Inc., gets wireless access to e-mail just about anywhere using Research In Motion Ltd.'s BlackBerry pager. And like many IT executives, Abramo chose to train three people already on staff to set up and support the wireless e-mail server application, rather than recruit new talent.

"Our philosophy these days is to hire really good people," says Abramo. "And we prefer to take existing people and train them in new technologies, instead of hiring from outside. I also don't have to train them on my company and all the policies and procedures, and that's really important."

Two-Pronged Approach

Abramo's sentiments echo those of many IT executives who told *Computerworld* this fall that hiring developers, architects and project managers with wireless experience wasn't in their game plans for 2001 and isn't likely to get penciled in to next year's playbooks either. Rather than taking on

Continued on page 30



INGRAM MICRO relies on in-house talent to set up and support wireless systems, says CIO Guy Abramo.

For wireless development jobs, knowledge of the business and its needs is as important as technical know-how. By Lee Copeland

Finding Wireless Workers Within

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Finding Wireless Workers Within

Continued from page 28

specialized employees, they're turning to star performers in their own IT organizations or using outsourcers to get wireless projects off the ground.

Take, for example, Elcon Corp., an electrical contracting company in Mukilteo, Wash. Elcon is equipping its field managers with a wireless asset-tracking tool developed for Palm Inc.'s operating system. Internal employees developed the architecture and handled quality testing for the application, says Paul Gott, product development manager at Elcon. An outsourced firm did the coding.

Gott says Elcon does a good job of finding internal employees to take on new challenges. And the company uses contractors to handle the tasks those employees used to be responsible for.

Abramo has taken a similar approach at Ingram Micro, a \$31 billion distributor of computers and electronics in Santa Ana, Calif. He is relying largely on in-house talent for a new wireless e-commerce application the company is piloting. With the help of consultants from wireless vendor Brice Inc. in San Francisco, Ingram is using internal staff to build the new application — a cellular phone ordering system based on Sun Microsystems Inc.'s Java 2 Micro Edition (J2ME) standard.

"It's a huge morale boost," says Abramo. "Our guys know that when a new technology comes out, we're going to invest in them, rather than going outside to hire an expert."

"The economic downturn deserves the blame for putting new hires for wireless development on the back burner," says Jack Gold, an analyst at Meta Group Inc. in Southboro, Mass.

"There are a few projects here and there, but most organizations are not doing wireless projects," says Gold. "And those that are doing projects are pretty much relying on internal staff."

Looking Within

Most wireless development projects aim to provide access to corporate data from a mobile device. So it's no surprise that database administrators are getting tapped to take on wireless projects.

Los Angeles-based law firm Paul, Hastings, Janofsky & Walker LLP is currently developing two custom wireless applications that will let its attorneys input billable hours and find legal experts via BlackBerry devices, says Mary Odson, the firm's CIO.

"What we discovered is that the developer needs to understand the application that the device is doing queries against," she explains, adding that the



It's a huge morale boost. Our guys know that when a new technology comes out, we're going to invest in them, rather than going outside to hire an expert.

**GUY ABRAMO, CHIEF STRATEGY
AND INFORMATION OFFICER,
INGRAM MICRO INC.**

database administrator is often the keeper of that knowledge. "What we're doing is extending data from the desktop to a wireless device, and the database administrator manages that," she adds.

Web developers also factor prominently in in-house wireless endeavors because "a lot of wireless projects will have to do with deploying Web access on wireless device," says Abramo.

Gold doesn't expect hiring for wireless projects within corporate ranks to resume for another 12 months. But in

the meantime, IT executives recommend keeping abreast of standards and shoring up strong horizontal skills that can be applied to wireless projects in areas such as security and project implementation when hiring heats up down the road.

John Stroili, vice president of IT at the American Institute for Foreign Study Inc. in Stamford, Conn., anticipates that IT workers with expertise in wireless security will be sought after.

Abramo advises wireless wannabes to shore up their project implementation skills and learn how to connect wireless applications to the Web.

"Wireless is an area that's highly theoretical right now. You need to hire people with pretty broad skills and practice experience," says Abramo, explaining that employers are seeking wireless professionals who not only have programming skills but also have a practical understanding of "how these things work."

Development experience with embedded systems, such as J2ME, the Palm operating system and Windows CE, is also a must. As is experience with radio frequency technology and with the 802.11b wireless specification, says Rick Rice, director of business development at Resource 360 in Norcross, Ga.

"Overall, the market is down, but wireless hiring is an area where there tends to be more activity," says Rice. ▀

Opportunities in Wireless

In contrast to the lull in wireless application development, rolling out wireless LANs appears to be the project du jour.

Package shipper United Parcel Service Inc. in Atlanta is spending \$100 million to deploy a wireless LAN and short-range Bluetooth network throughout its distribution hubs.

Premium-coffee kingpin Starbucks Corp. in Seattle launched high-speed wireless LANs in its 3,000 retail stores in January.

Friendly Ice Cream Corp. is just about done implementing a satellite WAN to its 570 restaurants and franchises in the U.S. But that's all the \$600 million Wilbraham, Mass.-based food chain has on tap for wireless this year.

"It's a management process," says Pete Palumbo, senior vice president of

IT at Friendly Ice Cream. "When we got into the options, because of the commitment to equipment and maintenance, we just felt like satellite communications takes that away. There's less work on our part."

Unlike wireless application development, wireless LAN projects are popular precisely because wireless LANs are relatively easy to install and maintain, says Alan Nogee, an analyst at Cahners InStat Group in Newton, Mass.

"It's a one-time type of install, so there's no need to hire a full-time person for wireless LAN," says Nogee. "There is little difference between a wireless network and a wired network. The network administrator can implement it; it doesn't take a special person."

— Lee Copeland



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ENTERPRISE IT MANAGERS are getting a glimpse of the wireless future. Hundreds — and in some cases, thousands — of their companies' employees have begun carrying wireless-enabled Pocket PCs, Palm devices and an array of other handheld computing products that can run multiple applications. It's a trend that could create administrative nightmares.

More than a dozen IT managers interviewed by *Computerworld* who are deploying wireless applications say they see a growing need for wireless management tools for small devices. But wireless support in enterprise management suites such as IBM's Tivoli and Islandia, N.Y.-based Computer Associates International Inc.'s Unicenter is still evolving, analysts say.

So for now, users rely on a broad mix of homegrown tools, more limited tool sets from smaller vendors — or nothing at all.

Great Expectations

Cendant Corp. has 31 subsidiaries, and each has thousands of workers carrying handheld devices, many of which are wirelessly enabled, says CIO Larry Kinder.

For example, service workers at Cendant subsidiary Avis Group Holdings

Inc. in Garden City, N.Y., use ruggedized handhelds to check in rental cars via a wireless LAN. And many executives are using Palm VILs or BlackBerry handhelds from Waterloo, Ontario-based Research In Motion Ltd. for wireless e-mail, inventory checks and calendar updates.

New York-based Cendant has management tools for its desktop systems that monitor hardware, operating systems, applications and assigned users and also automate software updates and virus scans. Kinder says he would

like that same capability for wireless devices.

"Absolutely, central management is essential," Kinder says. "But on handhelds, the management is more sporadic." Avis' only management tool is synchronization software from Symbol Technologies Inc. in Holtsville, N.Y.

IT managers say much needs to happen before large organizations can successfully install and use wireless management software. For one thing, software vendors need to make products with better wireless support, they say. And wireless bandwidth needs to increase so IT can push software upgrades and virus signature updates to devices and capture data for backup.

"We feel there's a lot more we can do someday with pushing information

Continued on page 35

AT A GLANCE

The market for mobile device management software is expected to reach \$630 million in 2005, up from \$83 million in 2000.

STEPHEN DRAKE, ANALYST, IDC

As wireless devices proliferate in the enterprise, better management tools will be needed, users say. By Matt Hamblen

Wireless: Seeking New Management



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Wireless: Seeking New Management

Continued from page 32

to handhelds," Kinder says, suggesting centralized user and device configuration profiles would be helpful. And, he adds, CIOs would "feel a lot better if the big management software vendors were doing more with wireless." Truly effective tools for wireless and mobile devices are probably two years away, he predicts.

Bracing for the Inevitable

That may not be soon enough for some IT managers. "The point is that the handheld devices are out there, and IT may be a little slow to support or monitor them, but they are there, and they are no longer toys. IT needs to recognize that fact and rein them in," says Stephen Drake, an analyst at IDC in Framingham, Mass.

Management of wireless devices "is not so much of a problem if you have 15 devices, but what if you have 15,000?" says Jack Gold, an analyst at Meta Group Inc. in Southboro, Mass. "Wireless management is going to be a big

issue in the next few years," he says.

Managers at large companies are just beginning to confront wireless management issues, Gold says. They are deploying the piecemeal management tools of the various wireless portal integration companies instead of integrating the devices into the existing, centralized management software they use for desktops and servers, he says.

Royal & Sun Alliance Insurance Group PLC in London has implemented wireless management software. About 300 of its risk assessment engineers use laptops that can synchronize wirelessly or via dial-up connections. Using iMobile synchronization and management tools from Synchrologic Inc. in Alpharetta, Ga., IT staffers can retrieve Windows Management Interface asset information about the user and laptop hardware and software. The tools can even find and remove unauthorized software — but only over a wired connection.

The biggest players in enterprise management tools all claim to support

wireless devices. "But the question is whether their solution really does connect to all wireless devices and let the central administrator know what's there, what operating system it has running, what application, and can you upgrade it centrally?" says Gold.

While offerings from the enterprise management tool vendors are limited, smaller vendors have stepped in, according to Drake. "Most of the [smaller] management companies have hooks into centralized management tools" and can function effectively alongside them, he says.

A dozen smaller vendors, including Aether Systems Inc. in Owings Mills, Md., have developed wireless management software or have plans to move mobile management software to wireless devices. And in some cases, says John Girard, an analyst at Stamford, Conn.-based Gartner Inc., the big players are relying upon partnerships with these smaller vendors to provide wireless support (see article below).

Management Alternatives

Sprint PCS Group in Kansas City, Mo., isn't waiting for these partnerships to mature. The company has authored its own tools to manage wireless devices, including Kyocera Corp. smart phones, carried by its 1,200 salespeople. The homegrown software lets administrators see the last time a user logged in, the devices he's using and some of the information he's accessing, says Anita Otto, director of

“

Absolutely, central management is essential, but on handhelds, the management is more sporadic.

LARRY KINDER, CIO,
CENDANT CORP.

business sales and distribution.

For companies with simpler wireless applications, management tools are less of an issue. Merrill Lynch and Co., in Princeton, N.J., has distributed about 3,000 BlackBerry devices to employees, primarily for receiving e-mail, says Kevin Adams, vice president of mobile technologies. Because the company uses only one standard device with one primary application, Adams says, "the management resides with LAN support and computer support teams" without any special tools.

Adams says he hasn't yet seen a "real business case" to have a centralized console that would allow management of wireless devices alongside PCs and other parts of the IT infrastructure. Enterprise management software makers "don't have any proven solutions yet, and you could end up spending \$300,000 for it and then ask yourself, 'What did I get myself into, now that times are tight?'" he says.

But at Pitney Bowes Office Systems Inc. in Trumbull, Conn., new applications are making management a concern. Some 1,200 service technicians use BlackBerry devices over a Motient Corp. wireless data network for receiving dispatch information and ordering parts. Now the company is expanding its enterprise resource management and customer relationship management systems to support wireless devices for salespeople.

"I do see a need for a central management console" that looks at the wireless devices as a part of the entire IT infrastructure, says John Chillock, vice president of customer service operations. ▀

Tools for Wireless Device Management

The enterprise management suites available today offer limited support for wireless.

Wireless management software should be able to detect and monitor wireless end-user devices, but it should also monitor the wireless network service and support automated downloading of software and device driver updates to mobile devices. While all of these services aren't fully available in enterprise management suites today, the top three vendors are promising full support or are providing it through partnerships to add the missing pieces.

IBM'S TIVOLI SYSTEMS INC. division in Austin, Texas, offers the Smart Handheld Device Manager (SHDM) for Palm OS or Windows CE. SHDM works over synchronization servers or across wireless LANs and WANs. Its functions include device discovery, software distribution and configuration management. The SHDM technology, which has merged into Tivoli's Personalized Services Manager, includes technology from IBM partner Extended Systems Inc. in Boise, Idaho.

In the first half of next year, IBM plans to announce a product based on open standards to allow enterprises to manage all

devices, including wireless ones, from a central console. It will be available as part of WebSphere or separately, says Jeff Griffin, market manager for client solutions at IBM's Pervasive Computing division.

COMPUTER ASSOCIATES INTERNATIONAL INC. offers limited wireless management capabilities in its Unicenter software. Unicenter can monitor a wireless device's status and location, and it allows downloading of software updates, says Taoling Xie, director of brand management in wireless at CA.

HEWLETT-PACKARD CO. has announced that its flagship management software, OpenView, will be able to monitor and provide security for handheld devices. HP officials say the company plans to introduce server-based management tools that reach out to wireless nodes through application servers. However, none of those capabilities are available today.

— Matt Hamblen

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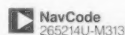
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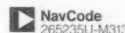
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 - Access to the information necessary to challenge the vendor's claims that are at the heart of this ploy.
- More specifically, a customer doesn't normally have the following information:

- Whether the vendor really would have a policy or legal problem if the concession was granted in the negotiations.
- Whether the vendor has or hasn't granted the same or a similar concession to another customer.

Because the customer doesn't have those facts, the vendor has the upper hand in negotiations. The customer must either accept the vendor's comments as true or tap into strategies to counter this highly effective ploy.

If you find yourself in this situation, you might

first respond by showing interest in the vendor's "problem." Ask the vendor representative: "You mean you actually would have a precedent problem if you granted us this concession? Does your firm really take these special cases seriously? Once you've set a precedent, do you really have to allow other customers the same concession? Do you keep track of this sort of thing?"

The vendor rep, thinking you're buying into his story, will usually pick up the lead and go to great lengths to explain his position, perhaps with a few references to previous precedent problems his company has experienced.

Respond by saying, "Well, if what you say is true, then we probably want many of your prior concessions, because it sounds like we're entitled to them." If the vendor

rep responds negatively, counter with something like this: "Look, you said you keep track of this kind of thing and your company has a policy of granting prior concessions to other customers. Before we can negotiate further, we're going to need a list of all your previous concessions so we can see which ones we want."

At this point, the vendor may bear an expression of silent disbelief. You have now successfully countered this ploy and gained control of the negotiations. So press your advantage!

Another tactic is to indicate your intention to find out about the precedents from other sources. Simply break off the negotiations to do some digging and obtain information from other parties about the vendor's previous concessions. The most likely sources of information about them are other customers, customer associations (such as CAUCUS), specialized publications and professional negotiators and advisers.

The mere threat to break off negotiations for this purpose often becomes an effective strategy, even if you don't try to collect useful information. Threats of broken-down negotiations should get a vendor's attention.

If a vendor rep insists that his company has never

granted particular concessions, call his bluff and ask for a "most-favored customer" provision in the agreement. Such a provision states that if the vendor has granted any customer a better price or contractual concession during a specific period (generally beginning before the execution date of the one you're negotiating and continuing for some stated period thereafter), then the vendor is obligated to give you the same concession. This provision can be written to apply to your entire agreement or to be tightly restricted to designated sections of the agreement.

Most major vendors have preapproved contract changes that are available if they're needed to get a deal done. But, as always, a customer must have a strong negotiating posture. As part of that, always ask for concessions. ■

THIS WEEK

BUDGET BOUNDS

An exclusive *Computerworld* survey reveals that more than two-thirds of U.S. companies are planning to shrink their IT budgets or keep them flat next year. That's why savvy IT leaders, such as Rowe Cos.' Suzanne Krupa (above), are focusing on IT projects aimed at reducing costs and generating quick financial returns. **PAGE 40**



SUSANNE KRUPA/ROWE COS.



TITANS' LEGACIES

Computerworld speaks with author Richard S. Tedlow (left),

who wrote an article for this month's *Harvard Business Review* that explains the valuable lessons IT managers can learn from legendary industry magnates such as Andrew Carnegie and Henry Ford. **PAGE 44**

CAREER ADVISER

Fran Quittel offers guidance to a 30-year IT veteran who has seemingly tried every possible gimmick to land a job, and she counsels a hardware/storage professional who's considering a career switch to software. **PAGE 46**

CREATIVE CARE

Alex Whitney, vice president and director of IT at Cline, Davis & Mann, sheds some light on what it's like to work in IT at an advertising agency that specializes in health care industry campaigns. **PAGE 48**



JOE AUER is president of International Computer Negotiations Inc. (www.dobetterdeals.com), a Winter Park, Fla., consultancy that educates users on high-tech procurement. ICN sponsors CAUCUS: The Association of High Tech Acquisition Professionals. Contact him at joea@dobetterdeals.com.

The IT BUDGET SQUEEZE

As IT spending dwindles, managers are looking everywhere for savings. Twelve-month ROIs have become the norm, while many firms are consolidating systems and bringing operations back in-house to improve their bottom lines. By Gary H. Anthes

THE ECONOMIC SLOWDOWN is squeezing IT budgets across industries in the U.S., and most IT budgets for next year are flat or down. Even for those companies whose IT spending will rise next year, that growth will be the lowest in years.

Projects without a quick payback are off the table, and IT money is increasingly being spent on activities that re-engineer business processes with an eye toward cost savings. IT managers are reacting to these budget pressures in various ways, from consolidating systems to renegotiating contracts to postponing technology upgrades.

At Rowe Cos. in McLean, Va., sales are tanking and budgeteers are slashing. The \$400 million furniture maker and retailer will cut its \$8 million IT budget to slightly less than \$6 million next year, says CIO Suzanne Krupa.

Any new project at Rowe that can't promise a 12-month payback will be scrapped or postponed, says Krupa. Interoffice telephone lines are being clipped because voice over IP is cheaper. Two point-of-sale systems will be combined, saving the company \$250,000 a year in licensing and support costs.

Krupa also plans to postpone upgrades for software such as Microsoft Windows and Office by two years. "We did a pay-now vs. pay-later analysis on

Microsoft, and guess what? We are going to pay later," she says. The postponement will net Rowe \$300,000 a year in license fees and support costs.

Only two areas at Rowe will get more funding next year — disaster recovery and business resumption planning. "I took a lot of heat for the monthly fees we paid for disaster recovery," says Krupa. "But on Sept. 12, I had every president of every operating subsidiary call me and say, 'We will never give you a hard time about that budget number again.'"

In an October survey of 209 senior executives at large U.S. companies, Forrester Research Inc. found that 32% had reduced IT spending since the begin-

Continued on page 42



SUZANNE KRUPA, CIO at Rowe Cos., says "EVA was a tremendous exercise" in helping her decide to postpone a project.

Measuring Up

IT managers vary in their approaches to tracking return on investment.

In the slowing economy, rigor in financial analysis is back in style, says Tom Mangan, a partner at Chicago-based accounting firm Andersen. "It was almost a forgotten skill—doing an ROI for a business case. But in the past six months, we've started seeing a big emphasis on that," he says. "We are seeing large [IT] projects shut down because they don't show any ROI."

Suzanne Krupa, CIO at Rowe Cos., says she uses simple ROI calculations to help prioritize projects—but it isn't enough. She also uses Economic Value Added (EVA) analysis, which is broader in scope and is geared to

maximizing shareholder value. EVA takes into consideration the cost of capital for a project, risk factor associated with the project and a targeted value return percentage.

Krupa says she used EVA analysis to evaluate a proposed enterprise resource planning system for a manufacturing subsidiary. It enabled her to estimate the cost of delaying the project, and when she found that it would be less than the computed cost of the business disruption associated with the system, she decided to postpone the project indefinitely. "The EVA was a tremendous exercise," she says.

Krupa has recently begun using a newer measurement called return on opportunity (ROO). ROO combines more than a dozen factors to assess the rate of change in the business environment, the rate of change in

business processes and IT infrastructure, the competitive environment and the value of intangible assets. It focuses on the potential gains in new business from, say, attracting new customers or boosting revenue from existing customers.

Even plain-vanilla ROI calculations would be a big step forward for many companies. In a recent survey of 50 IT executives, Forrester Research found that 54% of organizations either don't measure or use poor metrics to determine the success of technology spending.

For his part, Jeff Marshall, CIO at The Men's Wearhouse, says he uses standard financial measures when they are readily obtainable, as they would be in deciding whether to outsource payroll, for example.

But, he says, people all too often cook the

Determining ROI

How is your company measuring its return on investment for IT projects or IT spending?

**COMPUTERWORLD
EXCLUSIVE
SURVEY**

Decreased costs	83%
Length of time to payback	75%
Increased revenue	71%
Increase in productivity	70%
Project is up and running within a certain time	67%
Reduced head count	57%
Discounted cash flow	32%
Specific ROI formula or benchmark	19%
Not measuring ROI on IT projects	6%

Base of 150 respondents; multiple responses allowed

numbers to show what ROI they can to justify their IT spending. He cited an end user who wanted a laptop computer to use in airports, claiming it would make him 30% more productive.

IT priorities are established at Eastern Bank each year by a steering committee. "Nothing gets decided solely on financials," says CIO Lloyd Hamm. However, he says, anything with a payback period longer than 24 months would be unlikely to pass muster.

Hamm says the overall efficiency of IT at the bank is measured three ways: the IT cost per customer account, the IT cost per customer payment card and the IT cost per desktop PC. Management expects all three of them to show improvements from year to year, he says.

John Kopek, president of IT consulting firm Compass America Inc. in Oak Brook, Ill., warns against relying too much on a single measure. "People used ROI or net present value or cash payback. Then we got into return on capital employed, return on average capital, cash flow ROI and so on," he says. "But there is no one measure that encapsulates enough information to tell the [stock] market what you are doing."

— Gary H. Anthes

The IT BUDGET SQUEEZE

ning of the year. A similar survey in May showed that only 17% had cut their IT budgets at that point. Citing a "rapidly softening economy," Cambridge, Mass.-based Forrester says that companies had expected to cut this year's IT spending by just 0.3% on average in May, but, as of October, they were anticipating those cuts to average 5.7%.

A mid-October *Computerworld* survey of 150 senior IT executives at midsize and large U.S. companies found that 68% of the respondents expect their IT budgets next year to shrink or remain flat, which jibes with other recent studies conducted by Forrester and Stamford, Conn.-based Meta Group Inc.

The same is true at Exelon Business Services Co., the business services arm for Chicago-based Exelon Corp. Honorio Padron, president, CEO and CIO for the business services group, wouldn't divulge his organization's IT budget, but he says it will shrink by 20% next year.

Looking at operations with a view to both outsourcing and insourcing is one way to save, Padron says. He recently brought data center operations back in-house when he found he could do it for 40% less than IBM was charging. But he says Exelon will outsource some desktop support to IBM because IBM can do it cheaper.

Padron says he will revisit existing contracts with hardware, software and services vendors with an eye toward striking better deals. One way to do that is "pricing to the benchmark," he says. For example, in negotiating with IBM for desktop support, Padron is armed with benchmark figures from Stamford, Conn.-based Gartner Inc. on what it should cost to provide those kinds of services. "So I know what my target is, and we negotiate to that," he says.

Taking the Hem In

The IT budget at The Men's Wearhouse Inc. in Houston rose \$1 million to \$29 million this year but will fall to \$27 million to \$28 million next year, says CIO Jeff Marshall. "Given today's economic conditions, we are looking at all expenditures very closely,"

"Looking closely" means that having requests for

major new IT products or services must be approved by a new IT council that consists of Marshall and the company's five most senior business managers. "The council will look at an expenditure to see if it is necessary, if it is something that will drive the business," Marshall says.

In fact, Marshall says he will insist that the council scrutinize his group's 2002 budget. "The best defense is a good offense," he explains. "I want them to own the [spending] decisions."

Exelon's Padron says the key to holding down costs is simplicity, and that means taking a tough line with end users who want every new technology and every imaginable feature in application software. "Plain vanilla is the name of the game," he says. "It's vanilla ice cream. I know it's going to have some chocolate sprinkles on it, but no syrup."

And it's Padron who doles out the sprinkles. "We are doing a financial systems consolidation project, and the CFO and I own that project," he says. "All code changes must be approved by us. They have to bring a business case justification to us to change one line of code."

Meanwhile, IT budgets at some companies are rising, albeit at a slower rate than in recent years. Technology spending at Eastern Bank in Lynn, Mass., will rise from \$13 million this year to about \$14.5 million next year, says Lloyd Hamm, CIO at the

\$3.8 billion (in assets) bank. Cost-cutting efforts won't focus on IT expenses directly but on how IT can enable cost savings in bank operations, he says.

For instance, Hamm says he will bring in consultants to help him apply statistical measures to hundreds of bank functions. "We'll find out where we vary from best practices, and we'll build quality teams — with IT reps on every team — to make us more efficient or raise customer service," he says.

Hamm says the bank plans to undertake 10 such improvement projects next year and 10 more the following year.

In one effort completed earlier this year, Hamm combined customer statement printing and mailing operations — which had been separate

activities — into one business unit and reduced statement delivery time by 70%. A move to deliver online statements to commercial business customers next year should net the bank another \$50,000 to \$100,000 in annual savings, he says.

Krupa is spearheading a similar re-engineering initiative at Rowe. "Instead of looking at new technologies, we are taking an introspective look at each of our businesses," she says. Those efforts, each assisted by IT people, are intended to find ways to re-engineer processes for cost savings or quality improvements.

Says Krupa, "As IT executives, we have to first and foremost look at the business units and say, 'Here are the things that can help you improve your performance and your budget.' That in turn will be a direct reflection in the IT budget." ■

COMPUTERWORLD
EXCLUSIVE
SURVEY

2002 IT Budget Plans

Respondents expect their companies' 2002 IT budgets to remain close to the planned IT budget amounts for 2001, at about \$35.1 million, on average.

43%

expect that their companies' IT budgets for next year will stay the same compared with spending levels this year.

29%

expect their companies' IT budgets to increase in 2002 from actual IT spending in 2001. On average, respondents expect a 15% increase.

25%

expect to see a decrease in their companies' IT budgets compared with the amount spent in 2001. On average, respondents expect a 13% decrease.

Pluses and Minuses

Respondents most frequently expect their companies' budgets to increase for the following IT business areas in 2002:

Security	53%
Networking	46%
Web infrastructure	44%
Software	41%
Storage	40%

Decreases in budgets are most often expected in these IT business areas:

Consultant labor	34%
Hardware	23%
Application development	21%

SOURCE: C.W. SURVEY OF 150 SENIOR IT EXECUTIVES AT MIDSIZE AND LARGE U.S. COMPANIES, OCTOBER 2001



NUMBER OF PEOPLE
ON YOUR NETWORK

NUMBER OF PEOPLE
ON YOUR BACK

RETURN ON COMMUNICATIONS

Fact: The sales department has different needs than HR. Or manufacturing. Or customer service. And they all need to be on your network. But it's not enough to build a network just to run everyone's apps. You need one that'll do so without causing you massive headaches. And that will return your investment. Short and long term.

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BRIEFS

CIOs Anticipate Hiring Slowdown in First Quarter

CIOs expect a slowdown in IT hiring in the first quarter, according to a national poll of more than 1,400 CIOs by Menlo Park, Calif.-based RHI Consulting. Despite the 11% net increase in hiring that's expected for the quarter, the figures are still four percentage points below the prior quarter's forecast and the lowest increase in the survey's seven-year history. CIOs in the finance, insurance and real estate industries are the most optimistic about hiring activity during the first three months of the year. Twenty-two percent expect to add staff, while 3% foresee personnel reductions, for a net hiring increase of 19%. For more information, visit www.rhic.com/InTheNews.

FedEx Ground Names Tech Vice Presidents

FedEx Ground, a subsidiary of Memphis-based FedEx Corp., has named Roman Hlutkowsky vice president of operations technology and Kenneth Spangler vice president of application development, field systems. Both were most recently managing directors at FedEx Ground. In his new role, Hlutkowsky will oversee the development, deployment and support of technology and administrative processes in field operations, including FedEx Home Delivery. Spangler will lead a team of IT professionals responsible for ensuring the reliability and continuous improvement of numerous mission-critical applications, including package sorting systems for FedEx Ground's 27 U.S. distribution hubs.

Survey: Execs Emphasizing Customer-Centricity

Customers will be the top priority for executives in 2002, while the outsourcing of non-core business functions such as manufacturing will remain a key strategy for growth, according to a recent survey of 150 high-level Fortune 1,000 executives by New York-based Accenture. The study also revealed that executives see customer relationship management (CRM) as a top business strategy or technology for next year. Thirty-eight percent of the survey respondents said CRM is their first choice; 26% identified new product development; 17% plan to tap enterprise resource management; and 15% plan to invest in supply chain management systems.

Learning Some Lessons From Titans of Industry

The author of a book on business innovators explains what he thinks IT managers stand to gain from them

The titans of American industry — larger-than-life figures like Andrew Carnegie, Thomas J. Watson and George Eastman — share certain characteristics that made them the legends they became, says Richard S. Tedlow in this month's Harvard Business Review. Tedlow's article is based on his new book, *Giants of Enterprise: Seven Business Innovators and the Empires They Built* (HarperCollins, 2001). While IT leaders today may not want to emulate the titans' more ruthless aspects, the best of their methods are still valid.

Even if you're not the titan type, you may find yourself working for, partnering with or competing against one — so there's a lot to be gained by knowing what makes them tick. Computerworld's Kathleen Melymuka spoke with Tedlow about what IT managers can learn from these moguls.

Q: Not every IT manager can be — or even wants to be — a titan, but can we learn from these guys?

A: Yes. Each of these guys stood for something. Each had a driving idea. Henry Ford wanted to put America on wheels. Tom Watson of IBM was convinced business was all about information. Each was extraordinarily focused.

Q: These titans not only had vision; you say they also had the courage to bet on their vision. Please elaborate.

A: The key is the ability to turn the vision into reality by relentless pursuit of the goal, even when things go bad. A titan's belief in his own vision is so great that when things look bad, he feels it's just a temporary misunderstanding by the cosmos and that it will all turn out right if he just sticks to the vision.

Q: How does a titan shape his vision into a company mission and a consistent message for customers, employees and investors?

A: "Intel inside." That's a consistent message that says, "We guarantee this

will work." They branded an ingredient. Wal-Mart's "Always the low price. Always." That speaks to the world. Titans are able to encapsulate the value proposition in a phrase and keep repeating it.

This is the latest in a series of monthly discussions with authors of articles in the HARVARD BUSINESS REVIEW on topics of interest to IT managers.

Q: Do you have to be a CEO to act on that principle, or does that translate to midlevel managers?

A: You need to have a message, stand for something, make it clear and repeat it. Then implement it. This is

not limited to titans. It's for anyone who wants to get something done in this world.

Q: You tell a great tale about Sam Walton placing the good of the company above everything — including his own dignity.

A: He did the hula on Wall Street because he made a bet [with his chief operating officer that Wal-Mart Stores Inc. couldn't achieve a pretax profit of 8% on sales]. And he did it on Wall Street, not in Bentonville, Ark. At the time, Wal-Mart didn't have much presence in the East, but if any investor walked out to see what was going on, they'd find out Wal-Mart was making a profit on sales that was incredible.

Q: Another principle from these titans is to deliver more than you promise. How might an IT manager take a lesson from Henry Ford on this?

A: Ford came up with the Model T, and it was better than anyone expected. Then he kept lowering the price, and he paid his workers twice the old manufacturing average at the time. He gave people more than they expected and got the best out of people. Any leader can take a lesson from that.

Q: There's a wonderful story about Bob Noyce's "staggering" self-confidence. Tell us about that.

A: As a young man, he got a call from William Shockley, who had been on the team that invented the transistor at Bell Labs and was world-famous. He was founding a semiconductor firm [Intel] in Palo Alto, and he invited Noyce out to talk about it. Noyce got out there and bought a house before he had the job interview. That's self-confidence.

Q: How can an IT manager walk the line between the kind of self-confidence that leadership requires and hubris?

A: It's a problem. That's what ruined the last half of Ford's career: He couldn't walk that line. The same with Carnegie. It's very difficult to keep your feet on the ground when you have more money than you can imagine.

Q: Did any of them succeed?

A: Walton was very good at that because he was dealing with customers and minimum-wage workers every day. The more successful you become, the more vital it is to keep in touch with the rank and file. They see what's going on. By abstracting from them, you cripple your own ability to be effective. And that's true for any leader.

Q: You say the titans never looked back, yet postmortems are considered a crucial part of IT project management. Where do titans draw the line on retrospection?

A: It's not that they don't learn from the past; they don't get stuck in it. Walton lost his first store in 1950 because he signed a lease he shouldn't have signed. As a result, he was very careful about leases. Everyone fails, but the titans

don't let it get them down.

Q: As you point out, the titans' success often came at some cost to their integrity. Do good guys finish last in American business?

A: They don't have to, but there is ruthlessness in business. That's why in IT, you have to develop your skills so you have the mobility to select the company you work for with great care. Choose your boss; don't just let the boss choose you. And if you're not treated with respect, get the hell out of there. ■



TEDLOW: "[Henry Ford] gave people more than they expected and got the best out of people. Any leader can take a lesson from that."

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Dear Career Adviser:

I was recently downsized from my position at a major brokerage where I was an assistant vice president of IT, managing an application development area.

I have over 30 years' experience in IT. I've worn many hats, from manager of data processing and project manager, to mainframe programmer, systems analyst, business analyst and consultant.

In the past three months, I've sent out over 400 cover letters and résumés resulting in just two interviews for positions for which I had no experience. At job fairs, only a handful of companies show up, and more than 2,000 people are waiting in line. I have my résumé posted on just about every Internet site I can find and have contacted recruiting firms with no luck.

What else do I need to do?

— AT MY WITS' END

Dear Wits:

Responding to online job postings, contacting recruiters and going to job fairs yields no greater success than answering newspaper ads did in the pre-Internet days. Finding new work will depend on your personal stamina and good old-fashioned person-to-person networking skills.

Step 1: Open up your contact lists to find individuals with whom you can connect on a personal basis. Contact every

one of them, advises Kevin Sternecker, senior vice president and CIO at Big V Supermarkets Inc. in Florida, N.Y. Then ask each of them this specific question: "Whom do you know who might need someone with my talents or skills?"

Step 2: Research a short list of companies for which you really want to work and identify your specific value-add for each of these firms. If you know about problems these organizations are having, become an expert in how you would solve them.

Step 3: Once you learn every-

thing you can about these companies and figure out what your specific contribution would be, put yourself into a context where you will meet someone from that company who can become your internal champion. Go to trade shows, user groups, special-interest groups and even shareholder meetings. You'll have to do this relentlessly, but in a job market where the action is "subterranean," it should eventually work.

Dear Storage:

If you've worked in the controller or adapter world rather than the disk-drive side of storage, you're in much better shape to make this transition, says Steve Denegri, managing director of system-area networking research at RBC Capital Markets in Memphis.

Engineers who have experience at the logical level will find it much easier to evolve their skill set to this new software-oriented storage



FRAN QUITTEL is an expert in high-tech careers and recruitment. Send questions to her at www.computerworld.com/career_adviser.

Dear Career Adviser:

I have eight years' experience working on the hardware side of storage and wonder if I would have more career opportunities moving over to the software side.

— STORAGE NOW

world. Specifically, engineers who understand the SCSI command set are well positioned, Denegri says, because it's likely that SCSI will survive for many future generations as a logical layer data transport. ▀

WORKSTYLES

Supporting Creativity

Cline, Davis & Mann Inc. is an advertising agency specializing in health-care industry campaigns. Alex Whitney, vice president and director of IT, offers some insight into what it's like to work in IT in such a creative environment.

Major clients and campaigns: Pfizer Inc. (Viagra); Glaxo-SmithKline (Serevent, an inhaler); Janssen Pharmaceuticals Inc. (Risperdal, for schizophrenia, and Reminyl for Alzheimer's disease).

Mission-critical systems: "Our desktop publishing system, which is an open prepress interface system called FullPress from Xinet Inc. that allows you to print [high-resolution] images really fast. We also use Xinet's K-AShare, a file-serving system that turns a Unix-based system

into an Apple server. About 90% of our systems are Macs, but we use [a Silicon Graphics] Origins Server because it's one of the most reliable high-availability solutions for Mac serving. Our financial system is DataTrak from Encoda Systems Inc., a sort of old-fashioned terminal application that runs on an HP 3000."

What's unique about IT in an agency environment? "We're mostly a Mac shop, which is different than most IT shops. Very little of our back end is Microsoft. We use Linux a lot, and Linux PPC [a version of Linux for older Macintoshes]. In terms of the business mission, we're oriented toward graphics and creative work, and billing — time sheets for billable hours."

IT training: "We're learning a lot about [Lightweight Directory Access Protocol] structure and IMAP [a mail protocol for server-based mail]. There's a huge Unix training push to adapt to Mac OS X. You wouldn't think that a Mac OS 9 guy could be a good Unix guy, but the transition is actually going well."

Workday: "Everyone gets here between 8:50 and 9:10

a.m., and people don't leave until all their work is done for the day. I left last night at 6:30, and everyone was still here."

Dress code: Business casual

Security badge/card needed to get into building or office? Yes

Must people carry beepers? Cell phones? "Cell phones. We get after-hours calls

about two or three times a week. And employees have our home phone numbers."

Little perks: Half-day Fridays in the summer, discounted movie tickets, an employee purchase program offering discounts on Dell PCs, reimbursement for personal digital assistants, and two big parties every year — a cruise on the Hudson River in the fall, and a black-tie holiday dinner dance in December.

Would employees feel comfortable e-mailing the CEO, Morgan Cline? "Absolutely."

The last word: "We're a customer service organization, and we're focused on solving the problems of our customers inside and outside the company. While it can be a little less stressful than other IT environments, it can be just as complicated, with a lot of the same problems."

— Leslie Jaye Goff
(lgoff@ix.netcom.com)

Cline, Davis & Mann Inc.

Main location: New York

Number of IT employees: Nine: IT director Alex Whitney, one database administrator, a Unix systems administrator, a project manager, a Web/intranet developer and four operations and support staffers. "In a small organization like ours, everyone overlaps a bit, and we do a good job of cross-training," says Whitney.

Number of employees (end users): 360 across five offices (four in New York and one in Princeton, N.J.)



As a product developer at JVC,
I was asked to create a hybrid
VCR that would revolutionize the
way people watch TV programs.
The challenge was to make it no
bigger than a standard VHS
recorder and get it to market within
a year. Did I reach my goal? You bet.



I CAN BEAT TIME.
I HAVE A FINGER ON THE FAST FORWARD BUTTON.

JVC
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JVC wanted to create a VCR like none other. One that combines the multifunctions of a hard disk drive with the familiarity of a VCR. So TV programs can be recorded and played back simultaneously. Size, of course, was a factor. So was time. That's why JVC chose Fujitsu's high-performance, highly integrated semiconductor solution, which provided all the necessary circuits on a single 28mm chip. With the technology and expertise provided by Fujitsu, JVC successfully developed a finished product within one year. Now even more people are tuning in to JVC. For more details, visit us.fujitsu.com/casestudy/. With a partner on the cutting edge of technology, you can accomplish anything.

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TECHNOLOGY

THIS WEEK IS SERVERLESS BACKUP READY TO ROLL?

It was supposed to be the killer app for Fibre Channel storage-area networks, but serverless backup hasn't caught on. Maturing technology may change that. **PAGE 50**



HANDS ON

HP rethinks the capabilities of a multifunction printer and creates a process for printing digital photos that's the epitome of user-friendly, says our reviews editor. **PAGE 54**

QUICKSTUDY

A process is an instance of a program running on a computer. It consists of the memory needed to run the program and the process' flow of control. A thread consists of only the flow of control. Find out more in this week's primer. **PAGE 56**

SECURITY JOURNAL

Security managers who want to know how they're doing shouldn't rely on annual audits, says Vince Tuesday. **PAGE 58**

EMERGING COMPANIES

IMarkup's software tools let users collaborate on Web page designs by marking up pages and sharing the markups with others over the Web. **PAGE 60**

NICHOLAS PETRELEY

Sharing the Tight Way

I RECENTLY COMPARED MICROSOFT'S PROPOSED SOLUTION TO DLL hell with the way Unix developers avoid ".so" hell [Technology, Nov. 12]. The term .so stands for shared objects, which are more commonly known as shared libraries. They are basically the Unix equivalent of Dynamic Link Libraries (DLL).

Microsoft is proposing a complicated procedure that would require developers to embed version numbers within header files, as well as create many new registry entries in some cases and replace registry entries with XML files in others. The solution on Unix is to simply rename the library file.

Admittedly, my explanation of the Unix approach was a bit of an oversimplification. So allow me to elaborate by describing how shared libraries are handled on Linux, which is a Unix clone. Consider yourself warned, however, that what I'm about to describe isn't the official policy on how to manage .so versions in Unix or Linux. This is simply my observation of how Linux library maintainers generally work. There's probably an official policy guide on .so versioning, but more likely than not, it simply describes what Unix programmers already do, which is whatever makes sense at the time.

Imagine that a group of people maintains a fictitious library called "libwidgets." These folks are reasonably happy with their work and release Version 4.0 of this library. Version 4.0 gains widespread approval, and it becomes the de facto standard version for libwidgets.

So the next time you install a Linux distribution, it will probably install a file called "libwidgets.so.4." The distribution maintainers may also install one or more symbolic links to this file. (If you're not a Unix person, a symbolic link looks like a file but is only a pointer to a file. Think of it as something similar to a Windows "shortcut.") This is a brand-new version, so it's probably necessary to create only one symbolic link, such as libwidgets.so.4.0.

The only reason you may want this symbolic link is because someone may build an application that expects to load the file libwidgets.so.4.0 instead of libwidgets.so.4. If you try to run that application without first creating the symbolic link, the program will complain that it can't find the library it needs, because it will be looking for the wrong file name.

Naturally, libwidgets will change. People will fix bugs and add features. If the

bug fixes are minor and don't seem to affect existing applications, it's up to the library maintainers, the Linux distributors or both to decide whether to change the version number of the library. They can release the fixed library as libwidgets.so.4 so that the new file overwrites the old one. Or they can release it as libwidgets.so.4.0.1.

If they choose the latter, they'll probably remove the old libwidgets.so.4 file and replace it with a symbolic link to libwidgets.so.4.0.1. At this point, if an application tries to load libwidgets.so.4, libwidgets.so.4.0 or libwidgets.so.4.0.1, it doesn't matter. They'll all end up loading the same file.

But if the libwidgets maintainers add significant features, change the way functions are used or fix bugs in ways that break existing applications, then it may be desirable to have two or more versions of the library coexist on the same system. In this case, when you update your system, it may install both libwidgets.so.4 and libwidgets.so.4.1 as separate files on the system. Application developers who need the new features or bug fixes will need to refer explicitly to the 4.1 library, but existing applications won't break, because they can continue to load the older version.

In theory, this could lead to a situation where you have dozens of versions of the same library on your system. But that never happens in practice, thanks to the open-source nature of Linux.

If a library breaks an open-source application, you can always recompile that application against the new library. That's what the Debian GNU/Linux maintainers tend to do.

That way, when you update a Debian system, the update program not only installs the fixed libraries, but it also automatically updates the recompiled versions of most, if not all, of the applications that use the fixed libraries. So in practice, you may end up with many symbolic links, but you rarely end up with more than two or three versions of any given shared library.

Thanks to all of you who have been sending me questions and comments. I don't answer every e-mail, but you can be sure I do my best to read them all. ▀



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SERVERLESS BACKUP: READY TO ROLL?

The killer application for storage-area networks has yet to catch on with users. Here's why. By Lucas Mearian

SEUNG-HO CHOI, CIO at Serome Technology Inc. in Seoul, oversees South Korea's newest and largest voice-over-IP service provider network. With more than 5 million users on the company's unified messaging service, any performance degradation or downtime on its servers and network related to backups equates to lost money. And Serome Technology has nearly a terabyte of e-mail data alone that it must back up regularly.

Choi chose to gamble on new serverless backup technology for his storage-area network (SAN), freeing up his unified messaging servers from having to process the flow of backup information from disk drives to tape. He estimates that his serverless backup software from Legato Systems Inc. in Mountain View, Calif., has cut server-related performance and downtime costs by at least 50%.

But Serome Technology is among a tiny minority of enterprises that have chosen to adopt the emerging backup technology.

When SANs began to take hold in large companies more than a year ago, vendors touted serverless backup as the killer application for SANs. However, the technology still has a few kinks that need to be worked out, practitioners say.

SANs greatly increase backup and recovery speeds by moving the backup processes off of the production LAN and onto the faster dedicated Fibre Channel SAN, but backup application servers continue to be a bottleneck as data moves from SAN-attached disks to server memory and across the SAN to tape libraries. A typical backup system can use up to 60% of the CPU cycles on a server, according to Meta Group Inc. in Stamford, Conn.

By all estimates, more than 15% of Fortune 500 companies are now running data backups on SANs, so serverless backup would seem to be the next logical step.

But the technology is complex. "You can't just throw [serverless backup] in and have it solve a problem. It takes some talent to make it all work together," says Michael Adams, product marketing manager at Veritas Software Corp. in Mountain View, Calif.

And the technology still has limitations. While all systems allow for a full restoration, not all of them allow for selective restoration of individual files or directories. "Most people do restores because someone lost a file or table space in Oracle. So, what's the point in bringing everything back when you only need this small piece?" says Adams.

What's more, serverless restore isn't available, says Meta Group analyst Phil Goodwin. "All available systems today restore the data through the server, not direct from tape to disk, and are therefore not a serverless implementation," he explains.

"We advise our clients to wait on the technology until vendors start to deliver serverless restore capabilities, which we expect to see sometime in 2002," Goodwin adds.

Still, Choi chose not to wait. Traditional server-based backup methods wouldn't be acceptable, "given the amount of data we needed to protect and the service levels we needed to provide," he says.

If the unified messaging service servers lose performance during backups, Choi says, "it will directly impact customer service levels and, ultimately, our bottom line."

Continued on page 52

AT A GLANCE

Serverless Backup

ADVANTAGES

- Faster backups
- Less processing overhead on servers

DISADVANTAGES

- Complex setup
- Restoration process isn't serverless
- Restoration of individual files isn't supported in all cases

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Continued from page 50

The fact that vendors tend to implement serverless backup technology differently also adds to the confusion over serverless backups, as does the fact that backup support for specific applications has been missing.

A serverless backup system generates a backup image, or "snapshot," (or, in some cases, a full copy) of the data. This first requires what vendors call quiescing — or suspending — running applications and flushing buffers to disk. That requires special agent software, and not all applications are supported. "Database support for these kinds of functions has been slow to reach market," says John Webster, an analyst at Nashua, N.H.-based Illuminata Inc. However, vendors are now beginning to provide such agents.

Once the backup server creates the disk image, it releases the application, creates a disk I/O address block map from the image and sends it to an intelligent "data mover" device, which facilitates the transfer between the disk and tape devices.

Different Approaches

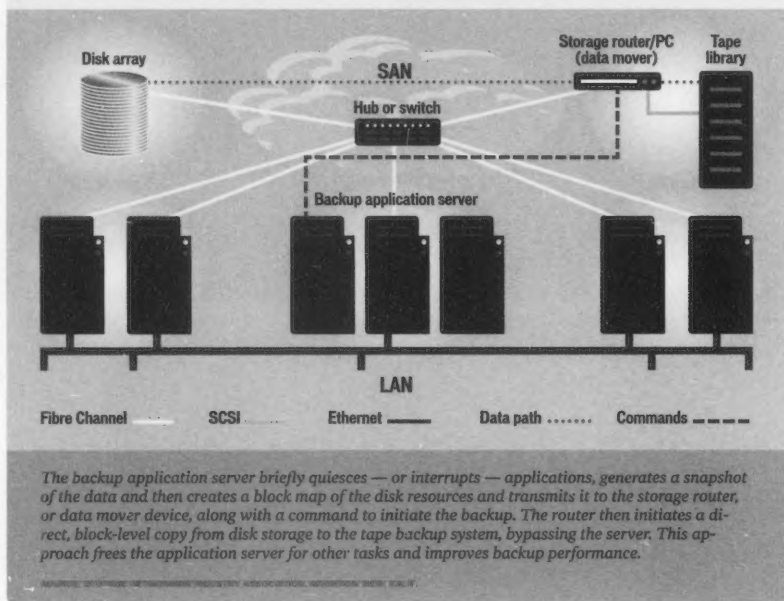
Vendors such as Legato use software installed on a special workstation or server to generate a block map of the data and another server to act as the data mover using its own copy process.

Other vendors use the Storage Networking Industry Association's (SNIA) model, which has the backup application server issue a SCSI-3 Extended Copy command to a SAN interconnect device, such as a storage router, to initiate data transfer.

In either case, the backup process isn't entirely server-free. "The backup application on the server still has to catalog the information that needs to be backed up. It sends that in the form of segment descriptors to the intelligent device," says S.W. Worth, technical marketing manager at Austin, Texas-based Crossroads Systems Inc. and a member of the Mountain View, Calif.-based SNIA's Interoperability Task Force.

Since the data to be backed up is stored in blocks, not files, individual files can't be retrieved. Some backup software vendors solve this problem by including a file map that's stored as part of the backup image. However, that function isn't supported in every case. For example, Veritas' NetBackup supports file-level restores for Unix but not for other operating systems, the vendor says.

Server-Free Backup



While serverless backup shows promise, the restore issues are showstoppers for users like Kurt Bahrs, a disaster recovery specialist at Aetna Inc. in Hartford, Conn. Bahrs, who is overseeing a SAN implementation that's expected to be completed by mid-2003, says serverless backup holds the promise of eliminating backup windows that take "tens of hours." But without a complete serverless restore function to complement it, he says, he's not interested.

"We're going to try to automate everything within our SAN environment with all our backups for mid-range and NT servers," he says. "The key is having a seamless product to do both [backups and restores]."

The iSCSI Option

Emerging iSCSI-based storage network connections may boost the popularity of serverless backup technology.

Serverless backup has a better chance of being adopted if it doesn't require a complex Fibre Channel SAN, says Illuminata analyst John Webster. The SNIA's proposed Extended Copy standard will enable that by supporting iSCSI networks as they emerge over the next few years.

iSCSI extends SCSI connections across existing IP networks to allow block-level transfers of data between storage devices, Webster explains.

"Serverless [backup] was the application backup scenario that was to be used by everyone to justify installing a SAN. That hasn't quite worked out because of cost and complexity," he says.

"iSCSI will help us get there quicker, in that we extend the reach of the SAN out to servers and workstations that are farther away from the data center. So it makes the whole process more palatable," Webster says.

— Lucas Mearian

Quick Link

All serverless backup implementations are not created equal. For more on vendor offerings, white papers, and a glossary of serverless backup terms, click on: www.computerworld.com/q/a1320



yipes
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Optical IP Networks

THE VAST MAJORITY of computer systems and processes depends on interfaces, graphical or otherwise, that are badly designed, inconsistent, illogical and often incomprehensible. They don't work all that well, either. For most applications, most of the time, the term *user-friendly* just doesn't apply; *user-hostile* would be more accurate.

That's hardly news to anyone. It wouldn't be worth repeating if I hadn't come across a stunning example of how good an interface can be as a piece of human engineering done right. Hewlett-Packard Co. has developed a remarkable system for printing digital photographs. It shows a level of innovative thinking about both hardware and software that is rare indeed. The system prints digital photos using a multifunction printer in HP's home and home/office line, the \$399 PSC

(printer/scanner/copier) 950. Before I discuss why IT should care about such a consumerish product, let's look at how it works.

1. Take a bunch of pictures on your digital camera.
2. Remove the memory card (which can be Compact Flash, SmartMedia or Memory Stick) from the camera and insert it into the appropriate slot in the printer.
3. Wait briefly while the printer automatically prints an index sheet containing thumbnail representations of all the photos.
4. Look carefully at the index sheet. Under each thumbnail is the file name of the picture and an oval.
5. If you want a print of that picture, blacken in the oval with a pencil or dark pen. (Remind you of test-taking back in school?)
6. At the bottom of the form, there's



HP's PSC 950

another place to indicate, again by filling in an oval, what size prints you want — 4-by-6-in. or 5-by-7-in.

7. Now here's the magic part: Take the sheet and place it on the flatbed scanner's glass. Press a button.
8. That's it. The printer figures out what it has to do, and then it prints your order.

The Hard Way

HP has managed to take the mystery and technical confusion out of an increasingly common process. Getting prints from your digital "film" is no more difficult than taking a roll of real film to a one-hour developer at the mall. Fill in a form, check a few boxes, and that's all. Your grandmother can do it.

To really appreciate the beautiful simplicity of the process HP created, look at what you have to do otherwise:

1. You've taken some pictures on your digital camera. Now you have to get them into your computer.
- 2A. Connect the camera to the PC.
- 2Ai. Find the cable that connects your camera to the computer.
- 2Aii. Plug it in on both ends.
- 2Aiii. Make sure that you've also got the camera's AC adapter plugged in.
- 2B. Maybe you've got a reader for your memory card. In this case:

2Bi. Find the reader and plug it into your computer.

2Bii. Remove the memory card from the camera and insert it into the reader.

3. Open the software that came with the camera, such as Adobe Systems Inc.'s PhotoDeluxe or Ulead Systems Inc.'s PhotoImpact.

4. Click on the menu to download pictures from the camera.

5. Look at the pictures on-screen and note which ones you like. Pay attention to file names, because they're typically something like "image1049.jpg" or "02260023.jpg" or (I'm not making this one up) "PhotoPC Thursday January 23, 1997 924 PM 5.jpg"

6. Highlight the picture you want and click on Print. Repeat for each picture. (If your software is decent, it will let you highlight multiple photos and print them with a single click.)

That's a lot to remember. You and I can do it, because we're IT professionals. But it's still easier to take the memory card down to the photofinisher at the mall. Especially if we can't find where we put the cable, the reader or the AC adapter.

A Lesson for IT

Now think about what your users have to do in the course of their work. Consider the software they're using — especially the software your department has developed. Think about all those IT-based tasks that users do just infrequently enough that they never quite seem to remember how to do it from one time to the next.

How well do your procedures and your processes measure up to the standard HP has set?

A few years ago, HP adopted the corporate slogan, "Invent." I believe the company really means it. ■

step 1: to select photo(s), fill in bubble(s) underneath with a dark pen

step 2:

select print options select only one choice per section	number of prints: <input type="radio"/> single <input type="radio"/> double	image size (in.): <input type="radio"/> 4x6 <input type="radio"/> 5x7 <input type="radio"/> 8x10	paper type: <input type="radio"/> plain paper <input type="radio"/> photo-quality glossy <input type="radio"/> photo-quality matte	<input type="radio"/> premium photo <input type="radio"/> 4x6 premium photo <input type="radio"/> photo paper <input type="radio"/> 4x6 photo paper
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HERE'S WHAT the PSC 950's index sheet looks like. Just mark the photos you want by filling in the ovals, indicate the desired size at the bottom, and the printer does the rest.

At Last: High Tech That Makes Sense

In a consumer-grade printer, HP has produced the best example of human engineering and process design I've seen in years. By Russell Kay



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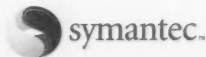


Now you can protect your company where it's most vulnerable: your front door. Symantec Web Security™ 2.0 defends your Web gateway from viruses that infiltrate through Web downloads. Today's only single-scan content security solution for web traffic, it combines list-based and heuristic technologies for advanced virus detection and filtering of unwanted web content.

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Both gateway solutions leverage Symantec's extensive scan engine technology called NAVEX™. It lets you implement the latest virus protection across all network tiers, quickly and cost effectively, without delay or scanning downtime.

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Processes and Threads

BY FRANK HAYES

PROCESSES and threads have one goal: Getting a computer to do more than one thing at a time. To do that, the processor (or processors) must switch smoothly among several tasks, which requires application programs designed to share the computer's resources.

That is why programmers need to split what programs do into processes and threads.

Every program running on a computer uses at least one process. That process consists of an address space (the part of the computer's memory where the program is running) and a flow of control (a way to know which part of the program the processor is running at any instant). In other words, a process is a place to work and a way to keep track of what a program is doing. When several programs are running at the same time, each has its own address space and flow of control (see diagram).

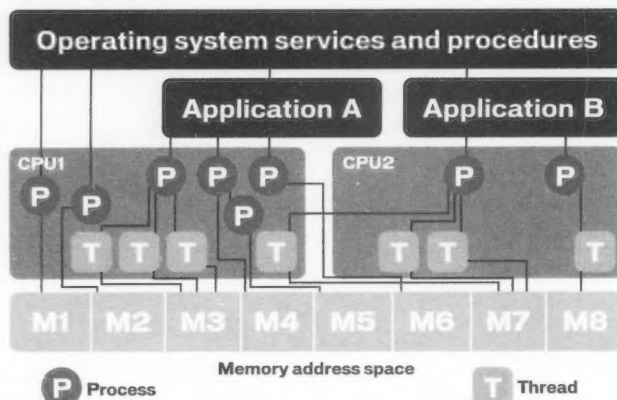
To serve multiple users, a process may need to fork, or make a copy of itself, to create a child process. Like its parent process, the child process has its own address space and flow of control. Usually, however, when a parent process is terminated, all of the child processes it has launched will also be killed automatically.

A multitasking operating system, such as Unix or Windows, switches among the running processes, giving CPU time to each in turn. If a computer has multiple CPUs, each process may be specifically assigned to one of the CPUs.

That's fine for simple programs. But a complex modern application, such as a word processor or spreadsheet, may actually look to the operating system like several different programs, with almost contin-

DEFINITION

A **process** is an instance of a program running on a computer. It consists of the memory necessary to run the program (the process's address space) and the ability to keep track of where in the program the processor is (the process's flow of control). A **thread** is similar to a process but consists of only the flow of control. Multiple threads use the address space of a single process.



uous switching and communication among them.

That's a problem, because it takes time to switch among processes. Modern CPUs include memory management units (MMU) that prevent any process from overrunning another's address space. Moving from one process to another—called context switching—means reprogramming the MMU to point to a different address space plus saving and restoring process information.

The operating system handles the details of the context switch, but it all takes time.

And because each process is isolated from the others, communicating between processes requires special functions with names like signals and pipes. Like context switches, inter-process communications require processor time.

All that time adds up when many programs are running at once or when many users each require several processes running at the same time. The more processes running, the greater the percentage of time the CPU and operating system will spend doing expensive context switches.

With enough processes to run, a server might eventually spend almost all of its time switching among processes and never do any real work.

Threading Through

To avoid that problem, programmers can use threads. A thread is like a child process, except all the threads associated with a given process share the same address space.

For example, when there are many users for the same program, a programmer can write the application so that a new thread is created for each user.

Each thread has its own flow of control, but it shares the same address space and most data with all other threads running in the same process. As far as each user can tell, the program appears to be running just for him.

The advantage? It takes much less CPU time to switch among threads than between processes, because there's no need to switch address spaces. In addition, because they share address space, threads in a process can communicate more easily with one another.

If the program is running on a computer with multiple processors, a single-process program can be run by only one CPU, while a threaded program can divide the threads up among all available processors. So moving a threaded program to a multiprocessor server should make it run faster.

The downside? Programs using threads are harder to write and debug. Not all programming libraries are designed for use with threads. And not all legacy applications work well with threaded applications. Some programming tools also make it harder to design and test threaded code.

Thread-related bugs can also be more difficult to find. Threads in a process can interfere with one another's data. The operating system may limit how many threads can perform operations, such as reading and writing data, at the same time. Scheduling different threads to avoid conflicts can be a nightmare.

Still, as complex, shared code and multiprocessor servers become more common, threads will continue to speed up multitasking. ■

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Annual Audits Target Security but Miss Mark

External information system checks are no substitute for a rigorous security assessment

BY VINCE TUESDAY

MEASURING THE effectiveness of a security program is notoriously difficult. One can identify the bare minimum for system defense and specify best practices, but how can one tell the excellent from the merely competent?

Lately, two events have been reminding me of these issues. First, my company is currently enduring its annual external audit. Second, it's bonus time. It may be selfish to view things in terms of my bonus, but it can serve as an objective measure of how well my team is performing.

To the uninitiated, a simple review of the security incidents that have occurred in the past year should indicate the effectiveness of a security team.

Unfortunately, getting at the truth isn't that simple. If you have a weak security process, you won't uncover the bad things that occur.

Also, security is about controlling and managing risk rather than eliminating it. We have to balance ease of business use against high security. In my industry, perfect security isn't cost-effective.

Perception vs. Reality

When I first started working in the security world, I looked forward to external audits. I saw the auditors as independent experts who could review objectively what I had been trying to achieve and give me pointers on how to improve. I expected a strong report that would help keep management support for my security initiatives.

Now I know the process much better. I don't look forward to external audits; I just prepare my list of user accounts and logical access controls. To be polite, I play the game properly: The auditors come, and I provide an hourlong pre-

sentation about our work this year: the deployment of personal firewalls to every desktop, the extension of our intrusion-detection systems from signature-based to anomaly-based, the automated virus update process and the delivery of dual Internet connections to provide some protection against distributed denial-of-service attacks.

They listen — the fresh graduate auditor looking wide-eyed on his day out

of the office to earn some billable time, the older auditor looking harried and lost. Then they nod and ask to run their cheapo in-house scanner software on our domain controller. They don't ask to run it on our production domain controller, but on our corporate desktop domain controller. Of course we refuse, because it's untested software and we have a change-control process for that sort of thing.

They look surprised, but we save the day by asking what information they require. They list the usual: account name, privileges, last log-in and so on. We run a shiny report from our vulnerability assessment systems and hand it over in hard copy. The graduate looks crestfallen, realizing he'll be spending tonight reading it to find something — anything — to report.

A week later, their report arrives with a spurious "medium risk" assigned to information security because, out of the thousands of accounts they reviewed, they found one that hadn't been used for a few weeks.

I suppose I shouldn't be bitter. If they did a proper job, they might find many problems, and we'd look bad. And we'd never hire them again. It's a nice, comfortable arrangement that helps both sides — the auditors don't have to do any real work (apart from that poor graduate), and we don't get any real

hassle. But how are we supposed to get better unless we are under pressure?

I can't imagine what it must be like on the other side of this farce — why would you become an auditor? Now that I've seen the time they can allocate to their reviews, I realize they just don't have the time to get to the bottom of anything until external factors force them to investigate.

So will auditors who are too underfunded to find anything guarantee me a nice, healthy bonus? I wish. My management is well aware of the depth of investigation involved in an annual audit. Instead, they will be measuring my performance based against my objectives set at the beginning of the year.

Inviting Attacks

So if external audits don't dig deep enough, and my bonus is based on achieving my objectives, what can I use to check that my team and I are on the right track? Perhaps a penetration test will help.

A penetration test is when a bunch of consultants pretend to be hackers and test your security — or, if you select another kind of company, a bunch of hackers pretend to be consultants and steal your data. We try to choose the consultants pretending to be hackers, and lately we have been using automated testing companies. The automated tests may not be as wide-ranging, but they're repeatable and can be run regularly, so they're good at spotting configuration mistakes that can creep into even the best-run organizations.

We have persuaded several of these firms to run free scans of our network, which allows us to evaluate their performance and get some very cost-effective results. We will take up a yearlong contract with the winner of these playoffs, so we aren't just stringing them along.

Luckily, the only thing any of them has found was a very esoteric bug in TCP/IP implementations, something to do with IP identifications that our operating system vendors haven't patched yet. I wish our auditors would point out this sort of weakness at the cutting edge of security. Considering that the penetration testers found something so far out and the fact they lit up our intrusion

THISWEEK'S LINKS

www.isaca.org/cert3.htm: Think you could do it better as an information systems auditor? Pass the Certified Information Systems Auditor exam and perhaps you'll be providing companies like mine with more thorough security assessments. This Web site includes conferences and training programs as well as exam information.

www.sans.org/infosecFAQ/intrusion/spoof.htm: Read Kevin Van Dixon's "Spoof Bounce" paper at the SANS Institute Web site to see the kind of risk that having a predictable IP identification can cause.

<http://razor.bindview.com/publish/papers/tcpseq.html>: This paper on TCP/IP "spoofing sets" shows how technically esoteric bugs get, but the threat is real.

www.insurance-finance.com/finance/financial.htm#reg: The annual audit is just one hoop security managers in financial services organizations must jump through. These 23 other regulatory agencies all have an impact as well.

www-2.cs.cmu.edu/~cheeko/intrusion/: Anomaly-based intrusion-detection systems are in their infancy, but interesting projects such as these provide valuable security services.

detection system like a Christmas tree, we can be certain they have tested the obvious weaknesses. And since the only thing they have found is something we can't yet fix, we can feel that we're doing our job properly.

We'll have to redo the tests on a regular basis to make sure we keep on top of new threats, but the clean bill of health makes me optimistic about the work we're doing. I do worry that we might be doing too much, and hence not be as cost-effective as possible, but I enjoy doing my job properly, so this doesn't keep me up nights.

Do you know a good way to tell that a security team is on the right (or wrong) track, or are you an auditor who wants to have a go at my conclusions? I look forward to the debate in the Security Manager's Journal forum. ■

Quick Link

For more on the Security Manager's Journal, including past journals, visit: www.computerworld.com/q7q2000





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Start-up Has Designs On Web Documents

*iMarkup's tool lets users write notes on
Web pages, collaborate on changes*

BY LINDA ROSENCRANCE

SINCE 1996, the staff at Case Western Reserve University's School of Medicine had been looking for a tool that would let faculty and students mark up, in real time, Web-based lecture notes that had been converted to HTML pages.

Until recently, no such technology existed, says David Pilasky, the school's manager and network administrator for biomedical IT.

Then Pilasky read about Vista, Calif.-based iMarkup Solutions Inc.'s iMarkup and iMarkup Workgroup Server products — Web page annotation tools that let users with a Web browser “attach” notes and other markups to live Web pages. The markups — including sticky notes, freeform drawings (using a paintbrush-like tool), text and highlighting — appear as a page overlay and are stored securely either on a user's PC (in stand-alone mode) or on a central server for display the next time the user navigates to that Web page.

iMarkup Workgroup Server requires a Windows Internet Information Server and an Oracle or Microsoft SQL Server database to store markup data. Clients need Internet Explorer 4.0 or higher and a plug-in to access the system.

'Perfect Solution'

Cleveland-based Case Western purchased the product to let students annotate Web page content. “iMarkup is the perfect solution for us,” Pilasky says. “It's the only one I've found, and I've been searching for years.”

iMarkup's products also ap-

peal to business users who want to collaborate about the Web on the Web, according to the vendor. Using iMarkup Workgroup Server's annotation capabilities, Web developers, designers and enterprise users can share thoughts about

Web pages in real time, says John O'Brien, iMarkup's president and CEO.

One business that's taking advantage of iMarkup's technology is Omnibilly, an Internet development firm in Campbell, Calif.

“Omnibilly's problem was finding a way for the marketing and communications people in our clients' companies to communicate [to us] the



CEO JOHN O'BRIEN says iMarkup's software lets Web developers share thoughts about page designs in real time.

iMarkup Solutions Inc.

640 Escondido Ave.
Suite 104
Vista, Calif. 92084
(760) 631-4560

Web: www.imarkup.com

Niche: Web-based productivity tools for collaborative document and Web page development

Company officers:

- John O'Brien, founder, president and CEO
- Marti Colwell, vice president of marketing
- Joby O'Brien, vice president of development

Milestones:

- January 1998: Company founded.
- January 2000: iMarkup stand-alone product shipped.
- March 2001: iMarkup Workgroup Server launched.

- September 2001: iMarkup Workgroup Server 2.0 launched with Portable Document Format and voice-annotation support.

Burn money: \$6.5 million in private funding

Products/pricing: iMarkup Workgroup Server 2.0 starts at \$2,445 for five concurrent licenses; customization and branding option starts at \$1,795.

Customers: Case Western Reserve University, Omnibilly and NIS Inc.

Red flags for IT:

- The technology works only with Internet Explorer browsers.
- It requires a browser plug-in on each desktop.

changes they wanted to make to their Web sites,” says Dean Dubbe, Omnibilly's vice president of client services.

Before it started using iMarkup's product, Dubbe says, Omnibilly had to engage in an often frustrating back-and-forth process with its customers to understand all the changes they wanted made to their sites. “Customers were clamoring for an easier, more efficient way to do business,” he says.

“With iMarkup, our clients can describe what they want done in a sticky note on the Web page, and we can look at the note and [make the changes]. It eliminates all the back and forth,” Dubbe says. “It was just what our clients wanted, because the faster we are able to implement the changes, the faster they are able to get the newer information to their customers.”

Laptop Note-Taking

At Case Western, Pilasky was so pleased with iMarkup that the university bought and installed the client version on the laptops it provided to first-year students in September.

Rather than write hard-copy notes, students can now, for example, go online while listening to lectures and highlight test questions, mark up the text that contains the answers and file the information and markups by category. When it's time to prepare for the test, students can go to iMarkup, see the test questions they highlighted and study the topics for their exams.

The latest version of iMarkup Workgroup Server, released in September, comes with voice annotation. At Case Western, it allows students and faculty to verbally explain information that's too difficult to communicate in writing alone, Pilasky says.

iMarkup is broadening its offerings. Next year, the start-up plans to roll out the iMarkup Document Review Server, a collaboration product that lets authors and reviewers upload, share and review documents. ■

the buzz

STATE OF
THE MARKET

A Documented Need

iMarkup's mission is to facilitate the Web document development process, according to Andrew Warzecha, an analyst at Stamford, Conn.-based Meta Group Inc.

iMarkup's collaborative tool is a useful part of the publishing process, says Warzecha. “The documents are the vehicle, and the collaborations are being placed on top of them,” he says.

Users may also find iMarkup's technology embedded into products from independent software vendors and application service providers for annotating, organizing and sharing information.

There are a couple of drawbacks to iMarkup's software that could turn off some users. For one thing, the technology supports only Internet Explorer. It also requires a browser plug-in. “It has a history of not wanting to deal with plug-ins,” Warzecha says.

iMarkup may be the leading vendor in its market by default. Competitor Equill Corp. discontinued its free visual markup service last month, and iHarvest Corp. was recently acquired by content infrastructure software maker Interwoven Inc.

Interwoven Inc.

Sunnyvale, Calif.

www.interwoven.com

Interwoven plans to incorporate iHarvest's technology into its TeamSite product, says company spokeswoman Kathleen Means. TeamSite lets people use any content creation tool they want, including Microsoft Office products and then gives them an environment in which they can collaborate with one another and test the content so they know it works and looks as it should.

Karen Auman, director of product management at Interwoven, says the vendor's VirtualAnnotate technology will take the ability to mark up a document online to the next level by making it part of the entire content management process. Users will be able to see a revised document with or without any markups. In addition, she says, changes will be layered over the document, so if a user doesn't want to present a certain change to a supervisor, for example, the user can delete that particular layer.

—Linda Rosencrance

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IT Careers in E-Business



While the surge in online retail and e-business received real energy in the late 1990s, there were some companies who ventured into the unknown much earlier. Among them was 1-800-Flowers, which went online in 1992 and was the first merchant listed by America Online.

"We define ourselves as a technology company," explains Enzo Micali, senior vice president and chief technology officer for 1-800-Flowers. "We were one of the pioneers."

Micali says the company continuously searches for talented people. "We are a growing company, with analysts estimating that we will have revenues of more than \$500 million this year," he explains. "We need people who have worked in large-scale environments, who have established processes and procedures. But I'm also looking beyond what you know right now. We need people who are willing to learn and engage, who are adaptable and enthusiastic."

Adaptability is a key at 1-800-Flowers. More than half the company's revenues this year will derive from online sales, and more than half its sales are non-floral. That means an ever-growing number of affiliates and partners.

Technology projects range from developing home agent call center capabilities to IT professionals who work in marketing, improving the interactivity of the

online site. Site development for 1800flowers.com and upgrades occur on a continuous basis, and the company serves as a Beta site for many new technologies.

In addition to the strong Internet presence, 1-800-Flowers also operates an extranet, Bloomlink, that began as a network for the company's floral partners. The infrastructure worked so well that its use is expanding to non-floral affiliates and partners.

"We offer opportunities ranging from support of internal operations to development of complex systems that drive our business," Micali adds. "Technology has propelled us far, and we're highly respected. It's a given that you'll receive the support you need here."

For more job opportunities with e-business firms, turn to the pages of ITcareers.

- If you'd like to take part in an upcoming ITcareers feature, contact Janis Crowley, 650.312.0607 or janis_crowley@itcareers.net.
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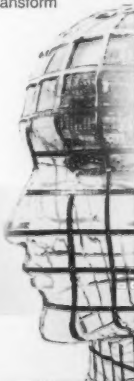
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Analyze requirements, design and program applications for Enterprise e-Business projects, working closely with consultants, business analysts and other developers. Applications will primarily be deployed on WebSphere servers running on AIX platforms.

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Data Base Design Analyst wanted for a brick manufacturing company in Canton Ohio. Must design logical & physical data bases and develop data model for purchasing and lot allocation system using MK (Manufacturing Knowledge) ERP System in the Ingres Environment. Must review project requests describing data base user needs. Must determine if project requires creating series of new programs or modify existing MK (Manufacturing Knowledge) software application. Must access data stored in Ingres databases using SQL, Triton Tools, 3GL and 4GL functions. Must review procedures in database management system manuals to make changes to database. Must integrate the ERP process with web applications using Visual Basic, Java and Crystal reports. Must have MS degree in Information Systems. No experience required. Respond to HR Dept., Belden Brick Company, P.O. Box 20910, Canton, OH 44701-0910.

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Software Engineer wanted to design and develop real-time Power. System Applications software for electrical utilities industry and energy management system. Master's degree in Computer Science or Electrical Engineering, and 1 yr related exp. required. Send resume to HR-18, ABB Network Management, Inc., 1601 Industrial Blvd., Sugar Land, TX 77478.

Software Engineers, Programmers, Systems & Business Analysts in (A) (B) (C) and (D)

(A) Migrate apps. from AS/400 to client server/web tech. using Java (and related tools) WebSphere, Weblogic, Apache, Tomcat, WSTK, JCA, JCE, J2SE, etc. (B) Oracle Web Apps. and Apps. (Accesses, OC, Inventory GL), Oracle Case, etc. (C) Migrate software apps. from mainframe using Cobol, DB 2, JCL, MQ Series, Oracle, SQL Server, Cold Fusion, ASP, Java, etc. (D) Borland C++, ADABAS, Natural, Cobol, VB, JCL/CICS, SQL, DB 2 and Foxbase. Multiple positions. Prevailing wage, HR Quantum InfoTech, Inc. 30060 Telegraph Road Suite 2220 Bingham Farms, MI 48025.

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Software Engineer wanted in Somerset, New Jersey to research, design/develop systems for remote access to Unix-based shared software applications to support web-based virtual private network functionality. Work w/variants of UNIX operating systems, TCP/IP socket for network programming, C++ & Perl. Requires M.S. in Comp. Sci., EE or Physics, plus 2 years experience in the job. Send resume to Ken Araujo, Netilla Networks, 347 Elizabeth Ave., Suite 100, Somerset, NJ 08873, reference code: SE-GI.

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Gallery Systems, NY, supplier of collections mgmt, imaging, & web-based systems to the world's great museums & galleries, seeks senior VB/SQL programmers, known as ASP/VB Script, JavaScript, Java, XML, Oracle, VB classes & creating COM components (DLLs, OCXs) is required; must have exp. in design, coding of accg systems incl. commission sales, consignment handling, check writing, AR, AP and GL; Req'd BS in CS or related field plus 5 yrs exp. CPA or equivalent highly desirable; competitive salary & benefits. Email resume to accptmgr@gallerysystems.com

Programmer Analyst req'd by Consulting comp w/BS & 2 yrs exp. w/rel. or its equiv. System Admin. of HP UX Servers, High availability Unix cluster configuration, Oracle RDBMS, Backups & Disaster recovery exp. Capacity Planning Evaluation & troubleshooting with Hardware & Software. Security & access control, monitoring, tuning, training & support. Equiv., based on Edu. & exp. Send res. Attn: Recruiter, Object Connection, Inc. 1103 Fox Chapel Dr. Lutz, FL 33549.

Multiple openings available for exp'd Prog/Systems Analysts, DBAs, Project Managers and Software Engineers. Duties include but not limited to developing and designing s/w systems using SAP, ABAP/4, Mercator, Cobol, CICS, VB, PowerBuilder, Developer 2000, Java, HTML, Sybase, Oracle, MS SQL Server, wireless internet/telephony technologies, e-commerce, data warehousing, LINUX/UNIX/Windows systems administration. All positions require a BS/MS or its foreign equivalent. Competitive salary. Some travel/relocation required. Send Resumes to: UNILINK, 4625 Alexander Drive, Suite 110, Alpharetta, GA 30022.

PROGRAMMER/ANALYST - Design & develop mainframe/microcomputer based applications. Req. BS in Comp. Sci. or Engineering (any field) and 1 yr exp. in job offered. Send resume with salary requirements to: HR Dept., Integrated Financial Solutions, Inc., 500 R/L 17 South, Hasbrouck Heights, NJ 07604.

Call your ITcareers Sales Representative or Janis Crowley. 1-800-762-2977

Sr. Systems Analyst: Design, analyze, develop, test, implement & maintain client/server projects on UNIX, WINDOWS NT, ORACLE Database design & analysis using Visual Basic for Applications 6.0, Visual Basic, Crystal Report 6.0, Data Dynamics, Active Reports, TDS/MS, Microsoft Visual InterDev 6.0 and HTML4. Work w/COBOL for mid-range & mainframe systems for conversion projects. Creating Spanish versions software interfaces & documentation by converting English originals. Supervise programmer analysts & IT personnel for software installation, implementation & maintenance. Req. B.Sc. or its foreign degree equivalent in CS, EE or other related field + 2-yr exp. in job offered. Resume to Staffing Manager, Job #SAF-120, Enterprises Computing Services, Inc., 8744 Main St., Ste 101, Woodstock, GA 30188.

Software Developers needed F/T by Software Dvlpmt Co. in NYC to drive cutting-edge projects and lead a team of developers, focusing on creation of software requirements and design. Must have Masters in elect. engineer. or comp sci. and 1 yr. exp., or equivalent. Respond to: HR Dept., E Commerce Group Products, 7 Day St., 4th Fl., NY, NY 10007.

Salem Associates has several openings for F/T exp'd Prog/Sys Analysts, Network Engineers, DBAs and S/W Engineers to develop applications using Cobol, CICS, VSAM, JCL, Java, PowerBuilder, HTML, VBScript, ASP, web/database technologies. Oracle Developer 2000, PL/SQL, VB, Perl, C++, Rational Rose, Roguewave, Oracle/Sybase/formix database admin; Unix/NT system admin. Require BS/MS or foreign equiv. in CS, Engg, Business, Science, Math or related field. 60% travel involved. Highly competitive salary. Contact HR, 7074 Peachtree Industrial Blvd., Suite 210, Norcross, GA 30071.

Programmer Analyst. Must have a Bachelor's degree or equivalent in Computer Science, Computer Engineering or a related field, plus minimum of 1 year experience in software design. Fax resumes to HR Dept., GSCC, (212) 260-0162: Refer to Job # EMP1085.

SkyMark Corp., a software development company, seeks a Chief Computer Programmer in our Pittsburgh, PA location. This position involves both coding and leading other programmers in design and implementation of commercial software products, working in Visual++, MFC, SQL, Access, JSP, Rogue Wave's Objective Grid, and Installshield. A qualified applicant should hold a BS in CS or related field, and have 5 yrs of relevant experience. Applicants should send resume to SkyMark, 7300 Penn Ave., Pittsburgh, PA 15208.

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Software Engineer req'd by s/w consulting co. Dvp. formative, design & modify comp applics. & specialized utility prgms, analyze user needs & dvp s/ware solts to determine feasibility of design within time & cost constraints, consult w/rel. to evaluate interface bet h/ware & s/ware & operational & performance aspects of overall system; analyze & design database. Use of Oracle Application Server 4.x, WebDB, Apache server, OEM, SOLLDR, Export/import Utility, Crystal Reports 5.0, PSQuery, SQR3.0, SQLBase, Unix, Linux, ERWIN, Dvpr 6.1 etc. Job to be performed in W. Lebanon, NH & other undiverted client sites throughout US as assigned. Req: Masters 1 yr exp or bach +5 yrs progressive exp. 40hrs/wk, 9a-5p, \$71K/yr. Response to be submitted in 2 copies of Resumes/Application, to: JCH 2002-027, PO Box 989, Concord, NH 03302-0989.

Sr. Engineer/Research Specialist in COMTECH PST Corp. innovative supplier of RF/MW amplifier technology. We design & develop solid state broadband amplifiers for use in various applications, including wireless high power test systems, defense systems and satellite communications. We are looking for a Sr. Engineer/Research Specialist in the area of transistor and hybrid modeling & evaluation through simulation analysis & testing HF through microwave frequencies. The ideal candidate will have Ph.D. in Engineering and 3 years of experience. We offer competitive salary & excellent benefits. Mail E-mail resume w/salary requirements to: COMTECH PST CORP., HR DEPT., 105 Baylis Road, Melville, NY 11747. E-mail: jobs@comtechpst.com. EOE M/F/D/V

Ordusion Technologies, Inc., Atlanta, has immediate multiple openings for experience Programmer/Analysts, S/W Engineers and DBAs in the following: VB, VC++, JAVA, HTML, ASP, Informix, Oracle, Sybase, CFM, financial/other commercial software packages, web/wireless/intranet technologies, Systems/DB administration etc. BS/MS degree (or foreign equiv) required. Highly competitive salaries, travel/relocation required. Send resumes to 6055 Atlantic Blvd., Suite K2 Norcross, GA 30071.

Thomson Financial currently has a position available for Team Manager at our Boston, Massachusetts office. Responsibilities include: management & direct oversight of 8-12 software developers, including staffing, budget and schedule responsibility and appraisal of team member's performance; mentor and technical review of software engineers; maintain and enhance an N-tier Win32 system that employs a front end based on JavaScript and DHTML, using XML and XSL, middle tier components based on Java J2EE and C++ and relational database technology (Sybase, Microsoft SQL) using JDBC. We require at least a Masters degree or equivalent in Computer Science, Electrical Engineering or related field, 5 years experience in software development on the Win32 platform, which includes the following: at least 4 years experience of web development experience using COM and relational database technologies, at least 3 years experience in managing development of HTML/DHTML, JavaScript, XML & XSL solutions and at least 1 year experience in Java/J2EE and Java/J2EE technologies. Experience may be gained concurrently. Please send resumes to: Thomson Financial, Attn: HR, 227 Newbury Place, Boston, MA 02210. Fax: 617-556-5601. We are an equal opportunity employer.

Software Engineer (Stamford, CT) (Pharmaceutical industry) to organize & direct functional system analysis; design & implement all assigned software applications; determine business requirements through interviews, observations & review of systems running on Unix 2200 mainframe; to design systems to meet user & corporate requirements; provide written procedures, specifications, instructions & training for end users; provide periodic oral & written status reports to users & top management; provide user training, guidance & support for on-site & off-site locations; monitor performance of installed systems; develop communication interfaces among all related operations & provide timely & accurate information flow; establish formal data flows within & between system operations using applications written in Cobol with interfaces to DMS1100 Database Management System & T1P100 Transaction Interface Package. Req: Masters degree or equivalent in Info. Sci. or Electrical Engr. (w/accept as equivalent in Info. Sci. or Electrical Engr. +5 yrs. exp. in progressively responsible positions in the field) and 2 yrs exp. in the job offered or 3 yrs. exp. as a Systems Analyst. Will accept M-F: 40 hrs/wk; 8am-5pm. Send res. to: S. Roesser, HR Dept., 1 Stamford Forum, Stamford, CT 06901.

Group Leader, Statistical Programming (Stamford, CT) (Pharmaceutical industry) Design, develop, validate & document computer programs using SAS v.6.12 (Statistical Analysis Software) in support of clinical trial analysis & submissions to regulatory agencies. Create, document & maintain SAS analysis data sets during statistical analyses & report generation. Develop, design & validate new programming applications, & update components of existing applications. Provide programming support expertise to bio-statisticians, clinicians & clinical trial personnel in the monitoring & reporting of clinical trials by creating summary tables, graphs, data listings & reports for inclusion in integrated statistical/clinical reports. Supervise 2 associate senior statistical programmers. Req: M.S. in Statistics, Math or Comp. Sci. + 2 yrs exp. in job offered. 35 hrs/wk; 8am-5pm. M-F. Send res. to: S. Roesser, HR Dept., One Stamford Forum, Stamford, CT 06901.

Sr. Systems Analyst Job location: Jacksonville, FL. Duties: Analyze user requirements, procedures & problems to automate processing or to improve existing computer system. Confer w/ personnel of organizational units involved to analyze current operational procedures, identify problems, & learn specific input/output requirements, such as forms of data input, how data is to be summarized & formats for reports. Evaluate effectiveness of existing info processing systems & develop new systems to improve productivity. Nonprofit as required, & determine if program/program change is possible w/in existing system. Plan/prep technical reports, memoranda, & instructional manuals to document program development. Specify operations of equipment & computer programs w/workflow charts & diagrams. Maintain systems after implementation. Design, develop, maintain & support applications in CL/400, dPL/400 & Synon/2e in IBM AS/400 environment. Utilize COOL/2e (Synon/2e), SEQUEL & Electronic Data Interchange for data origination systems. Requires: B.S. Comp., Elec. Engr., a related field or req. for requirements of overall system as a Programmer Analyst, 2 yr. exp. on IBM AS/400 using SYMPL/2E. Send resume to: InTuition, Inc., Debbie Perryman, 6420 Southpoint Pkwy., Jacksonville, FL 32216.

SOFTWARE ENGINEER

Research, design, and development of computer software systems, in conjunction with hardware product development, applying principles and techniques of computer science, engineering and mathematical analysis; analysis of software requirements to determine feasibility of design within time and cost constraints; consult with hardware engineers and other engineering staff to evaluate interface between hardware and software, and operational and performance requirements of overall system; formulate and design software system using scientific analysis and mathematical models to predict and measure outcome and consequences of design; develop and direct software system testing procedures, programming and documentation; consult with customer concerning maintenance of software system; coordinate installation of software systems. Knowledge of UNIX, Windows, C++, Visual C++, Java, Pascal, Fortran, Perl, TeX, HTML, DHTML, CGI, ASP, JavaScript, VB Script, Oracle, MS Access, Requires Bachelor Degree in Computer Science, Engineering or related field. Send resume to Sand Duchesne, SAIC, Sr. Group HR Mgr., 8001 Greensboro Drive, MS E-12-7, McLean, VA 22102.

Computer Support Specialist to install, modify and make minor repairs to computer hardware and software systems and troubleshoot major technical assistance and training to system users; diagnoses computer hardware, software and operator problems; performs or instructs hardware and software installation, testing and repairs; perform network designing, Server installing and network setting. Enters and modifies computer and observes system functions to verify correct system operation. Answers technical inquiries in person or via telephone concerning system operations. Writes or modifies settings or commands for programs to run under different operating systems. BS in Computer Science or related field required. \$24,000/yr, 40 hrs/wk. Send resume to Attn: Ivy College, 5015 Oakbrook Pkwy. #600, Norcross, GA 30093 or fax it to (770) 279-1946. Job Code: HS-ED

SYSTEMS/BUSINESS ANALYST: Rome, GA. Produce requirements documentation for computer software developed for commercial use to support in-house applications. Functions as the principal business analyst for VP in charge of software product development. Assist VP in the life cycle mgmt of computer software developed by the co. Communicate w/ exec. project sponsors, mktg & user reps to understand clients' needs for the proposed system & address concerns re business & applications. Communicate w/ product users & propose mods for product functionality into software programming specs. Utilize accepted vocab of the application domain to focus discussions w/ users & clarify user goals & use cases. Utilize computer systems analysis & design techniques, incl object-oriented design, to assist computer programmers to translate business system requirements into computer programming specs. Bachelor's equivalent in Computer Science, Business Admin., Commerce or Engineering & 2 yrs exp in the job offered or in a related business, systems analysis position including definition, development & implementation of computer systems to meet clients' business objectives. 2 yrs exp must include exp in using C++/Delphi & Object Oriented analysis & development. 40 hrs per wk. \$60K per yr. Must have legal authority to work in U.S. Forward resume to Universal Data Systems, 6 Matha Drive, N.W., Rome, GA 30156-2729.

SAP Analyst Lancaster, SC. Duties: Support SAP software system & its efforts w/ a SC at an expert level by providing programming, project implementation & training. Responsible for future implementation of SAP R/3 modules & upgrades. Perform report writing in all modules appearing in place (SD, MM, PP, CO, FI, AM, OM). Coordinate adjustment & mapping of configurations of SAP R/3. Coordinate EDI activities from & to all customers of 2F Lemforder North American Operations. Conduct training needs, conduct user training & coordinate training classes for users. Maintain SAP R/3 library & training data. Work on Troubleshoot SAP R/3 user-related problems. Req: Bachelor's or foreign equiv. in Mech. Eng., Comp. Eng. or related field & 2 yrs exp in the job offered or 2 yrs exp as a SAP Consultant or Production Engineer. Exp which may have been obtained concurrently must include 2 yrs exp programming, report writing, & troubleshooting in the SAP R/3 module. To apply, mail resume to: Mr. Paul L. Stachurs, 2F Lemforder Corp., 944 Quaker Dr., Lancaster, SC 29721.

SOFTWARE ENGINEERS (10 positions): require Bachelor's in Engineering/Computer Science/Mathematics/Science or closely related technical assistance experience providing skills in described duties, at \$70,000 per year. Senior Software Engineers (8 positions) with Master's and two years experience, at \$75,000 per year. Provide on-site consulting in design, analysis, analysis and development of software application in Oracle, DB2, SQL Server and Sybase, e-commerce and web applications development in Microsoft, Java and related technologies. Network management systems development with Netscape Server and related tools. SAP operating systems. BS in Computer Science or related field required. \$24,000/yr, 40 hrs/wk. Send resume to Attn: Ivy College, 5015 Oakbrook Pkwy. #600, Norcross, GA 30093 or fax it to (770) 279-1946. Job Code: HS-ED

ADEXA, INC. technology leader in AFS solutions has opportunities available in the following cities:

VP SEMICONDUCTOR INDUSTRY SOLUTIONS: Direct strategic marketing and sales of proprietary solutions to global semiconductor industry. Develop emerging product requirements to support sales pipelines and meet global semiconductor industry needs. Develop and insure adherence to short and long range goals for this major division of ADEXA's business organization. Travel extensively to various and unanticipated client sites. Position available in Los Angeles, CA.

Req: Two years post-secondary training in business, plus 10 years business experience in the high-tech industry, 3 of which must be in supply chain software licensing management.

CONSULTANTS/SR CONSULTANTS: Develop, design and implement client specific supply chain management software solutions. Configure models, develop reports and build report generators, map data flows, and test software solutions. Develop and test internal model logic, and write custom algorithms to support the client's required solution. Travel extensively to various and unanticipated client sites. Sr. Consultants oversee 2-4 Consultants. Positions available in Los Angeles, CA and Norwalk, CT.

Req: MS in Eng., Computer Sci., Bus., or related field plus 0-2 yrs. relevant wk. exp. or BS in same fields plus 1-2 yrs. related wk. exp. for Consultants and 2-4 yrs. related wk. exp. for Sr. Consultants. Exp. with UCL, MRP or MES, and ERP.

PRE-SALES SR. APPLICATION CONSULTANT: Develop software models for production planning, manufacturing scheduling, facility sequencing, distribution planning, inventory control, demand forecasting, and strategic planning for supply chain management software sales opportunities. Work with Research and Development on prototype solving algorithms for future sales opportunities. Travel extensively to various and unanticipated client sites. Position available in Norwalk, GA.

Req: MS in Industrial Eng., Operations Research, or related field plus 1-2 yrs. related wk. exp. or BS in same fields plus 2-4 yrs. related wk. exp. Exp. with UCL and optimization and computer algorithms.

Send resumes to HR at careers@aDEXA.com

SENIOR WEB MASTER/ FUNCTIONAL ANALYST (SOFTWARE ENGINEER): Perform functional and graphic design associated with the development and technical programming (ASP, NET, IIS, SQL Server), hosting, deployment and management of auction non-auction, dynamic and e-commerce Internet applications, particularly those using Siebel eBusiness Application Software. This includes data writing and retrieval to various database formats, including, but not limited to, Oracle, Microsoft SQL Server and Openrite proprietary flat files; development and adherence to web site development and deployment methodologies; and functional design and management of auction and non-auction Internet Applications. Must have 6 yrs. exp. in job offered, or 8 yrs. exp. as Software Eng., Systems Eng., IT Supervisor, Network Eng., or related or any suitable combination of exp. training and/or education. His 9a-6p M-F Please send resume to Gary Strauss, VP/CFO, ReCellular, Inc., 1580 E. Eisenhower Road, Ann Arbor, MI 48108 and reference ad #1001.

Progress Applications Developer - Milwaukee, Wisconsin
Works with end users to fulfill business needs by supplying technical/systems solutions through the use of analysis and programming. Makes detailed analysis of projects. Develops technical specifications. Works with database concepts, both distributed and centralized, to produce effective systems, incorporating hardware, software and communications elements. Uses approved system design methods incorporating standards of screen, report and flow layouts. Performs efficient and effective programming, database creation, and unit and system testing activities as defined in design documents. Ensures that program documentation is current and appropriate. Required is a Bachelor of Science degree in Computer Science or Management Information Systems and six (6) months of experience as a Progress Applications Developer or six (6) months of experience as a Programmer/Analyst. As part of the required experience in the position being offered or in the related occupation, the applicant must have had experience in mainstream software development, had experience with Progress, including GUI development running under UNIX or Windows NT, and had experience in analysis, database and program design, program or application testing, report packages or internally developed systems. The applicant must also be certified in Progress. Applicants must have proof of legal authority to work permanently in the United States. Please submit resume and cover letter, including job code Pro101, to: IT Recruiter, Human Resources, Virtual Care Provider, 111 West Michigan Street, Milwaukee, Wisconsin 53203.

SENIOR SOFTWARE ENGINEERS required for our Livingston, NJ office. Analyze, design, develop and implement mobile computing applications using PALM, RIM, ECRM, ASIC, XML, BLUETOOTH, data warehousing, C++, OOD, Java. Salaried with cross platform ability to develop applications on client/server systems, configuration of Oracle/MS databases, and real time application with SOGB. Provide training to software developers on client/server tools. Masters degree required in Computer Science, Computer Engineering or any other related field of study plus 2 years of experience in the job duties described above. Employer will accept 5 years of related, progressively responsible past Bachelors experience in place of the Masters and 2 years mentioned above, 40hrs/wk. Please send a resume and a cover letter to HR Manager, DoingWap, Net, Inc. 316 Eisenhower Parkway, Lower Level, Livingston, New Jersey 07039.

SR. SOFTWARE ENGINEER (position located in Atlanta, GA) to perform sr. level design, development, implementation and support of network or internet-related software applications for commercial or end user applications such as materials mgt., financial mgt., HRIS or desktop application products; Write code and complete programs for commercial or end user applications using current prog. languages and technologies; Interface with users to define sys. requirements and make modifications as necessary. Required: Master's degree in Comp. Sci., Elec. Eng., or a closely related field, with 2 yrs. exp. in the job offered or as a Software/Applications Engineer or Sr. Prog./Anal. Competitive salary and benefits. Hours: 8-5, M-F. Send resume to: KM-HR, CheckFree Services Corporation, 6000 Perimeter Drive, Dublin, OH 43017; ATTN: Job FD (No Phone Calls Please)

SR. SOFTWARE ENGINEER (position located in Baltimore, MD) to analyze, design, program, debug, and modify local, network, or internet-related computer programs for commercial or end user applications such as materials mgt., financial mgt., HRIS or desktop application products; Write code and complete programs for commercial or end user applications using current programming languages and technologies; Interface with users to define system requirements and make modifications as necessary. Required: Bachelors degree (or foreign equivalent) in Comp. Sci., Electrical/Electronics Eng., or a closely related field, with 1 yr. of exp. in the job offered or as a Sr. Prog./Sys. Analyst. Competitive salary and benefits. Hours: 8 am-5pm, M-F. Send resume to: KM-HR, CheckFree Services Corporation, 6000 Perimeter Drive, Dublin, OH 43017; ATTN: Job MJ (No Phone Calls Please)

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Please indicate specific title/location you are applying for on your application letter. Send your resume referring to ad #ITC1210, to: **Compuware Corporation, Attn: Recruiting Dept. 31444 Northwestern Hwy., Farmington Hills, MI 48334 E-mail: eds@compuware.com** **www.compuware.com EOE**

Exec Search, Inc. a technology consulting firm seeks multiple individuals for the following positions in our Brookfield, WI office:

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Applicants for the above positions should possess Bachelor's degree or higher in a related discipline, as well as relevant experience. Relocation may be necessary depending on the particular employment position.

Apply w/ resume to: Exec Search, Inc. C/O BSS 1300 Bent Creek Boulevard, Suite 200 Mechanicsburg, Pennsylvania 17050

SOFTWARE ENGINEER (position located in Baltimore, MD) to analyze, design, program, debug, and modify local, network, or internet-related computer programs for commercial or end user applications such as materials mgt., financial mgt., HRIS or desktop application products; Write code and complete programs for commercial or end user applications using current programming languages and technologies; Interface with users to define system requirements and make modifications as necessary. Required: Bachelors degree (or foreign equivalent) in Comp. Sci., Electrical/Electronics Eng., or a closely related field, with 1 yr. of exp. in the job offered or as a Sr. Prog./Sys. Analyst. Competitive salary and benefits. Hours: 8 am-5pm, M-F. Send resume to: KM-HR, CheckFree Services Corporation, 6000 Perimeter Drive, Dublin, OH 43017; ATTN: Job MJ (No Phone Calls Please)

PRINCIPAL MEMBER OF TECHNICAL STAFF: Responsible for systems engineering & Advanced Intelligent Network (AIN) system architectural design. Design detailed requirements for new circuit, packet & hybrid communications services including messaging. Work with marketing & service concept personnel to define service architectures which meet identified customer functional & performance needs in a timely and cost effective manner. Prepare detailed technical requirements to guide development & testing of new offerings and will conduct performance impact analyses. Will also serve as a key member of software design teams in successfully bringing new AIN products/services to the marketplace. Req: Master's or foreign degree equivalent in Computer Science, Engineering, or related field plus six (6) yrs of exp in the job offered or six (6) yrs of exp in the field of telecommunications software research development. Employer will accept a Bachelor's degree in Comp. Sci., Engineering, or a related field plus eight (8) yrs of progressive exp in the field as the equivalent of a Master's degree. Salary: \$111,900/yr. 40 hrs/wk, M-F, 8am-5pm. Apply in person or send two recent resumes to: Metro, Job Order IGA 7040470, 2636-14 M. King Jr. Dr., Atlanta, GA 30329 or nearest Department of Labor Field Service Office.

Software Quality Assurance Engineers for software and hardware engineering for control systems company. Duties include: Designing and developing software and hardware test cases and scenarios, performing software testing using automated tools, and developing and integrating testing tools to ensure the quality levels of company's products. Documenting test procedures utilizing formal system quality assurance guidelines and performing customer acceptance testing activities. Validating that the software products satisfies its intended use. Writing automated test scripts for use with the Mercury Interactive X-Runner and Win Runner automated test tools. Requires a Master's degree in Computer Information Systems, Computer Science, or a closely related field, and one year experience in the job offered or one year experience as an Electronic Test Technician. Hours are 8:00 a.m. to 5:00 p.m. (40 hours per week). Salary is \$60,563.20 per year. Send resume to MDC/D/ESA, P.O. Box 11170, Detroit, MI 48202-1170, Ref. #201034. Employer-paid ad.

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Senior Programmer Analyst, Mainframe. Rancho Cordova, CA: Multiple openings. Provide applications programming services in a mainframe production environment. Maintain an understanding of leading tools and technologies available for development mission critical web, database and related applications. Duties will deal with complex aspects of design, maintenance and implementation of company's production applications. Job duties involve usage of IBM OS 390, DB2, CICS and ADABAS and mainframe structure programming techniques and programming languages such as Natural, Construct, Entire X, Predict and Pack. Requires: B.S. or foreign equivalent in MIS/Computer Science/Business Administration or related field, 2 yrs. exp. in job offered or as Programmer/Analyst/Consultant. Experience which may have been obtained concurrently must include 2 yrs. exp. in usage of ADABAS and mainframe structure programming language NATURAL, EOE. Advs. Send resume (no calls) to Mr. Jeff DeGroot, Senior Technical Recr., TruFund 3300 Zinfandel Drive, Rancho Cordova, California 95670.

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SOFTWARE ENGINEER to design, develop, test, implement, maintain and support IBM mainframe business critical card application software using TSO/ISPF, JCL, MVS/COBOL, Assembler, DB2, VSAM, CICS, Changeman, Inman, Unibus, Strode, Xpediter, File-Aid, Platinum, IDCAMS, Domino, dms-MS-Wend and MS-Project on MVS/390 and Windows NT platforms. Required: B.S. degree in Computer Science, an Engineering discipline, or a closely related field with five years of progressively responsible experience in the job offered or as a Programmer/Analyst. Competitive salary offered. Send resume to: Debra L. Crow, Citibank Universal Card Services, 978 Bayview Road, Jacksonville, FL 32256; Attn: Job SK.

Business Analyst II. Test, develop, implement and assist in the development of database system specifications; assist in the assessment of product development programs; prepare digitized data for processing, including creating computer reports and review the quality of processed data and methods for testing data.

Minimum requirements: Bachelor's degree in Economics, Math or Statistics. \$35,000 per year, 40-60 hours per week, including overtime, nights and/or weekends to meet semi-monthly deadlines. Relocation expense reimbursement not available. Must have indefinite right to work in U.S. All applications must be received within 30 days. Send resumes to Alicia Ruedell c/o ChoicePoint, Sr. Technical Recruiter, 1000 Alderman Drive, 70-A, Alpharetta, GA 30005.

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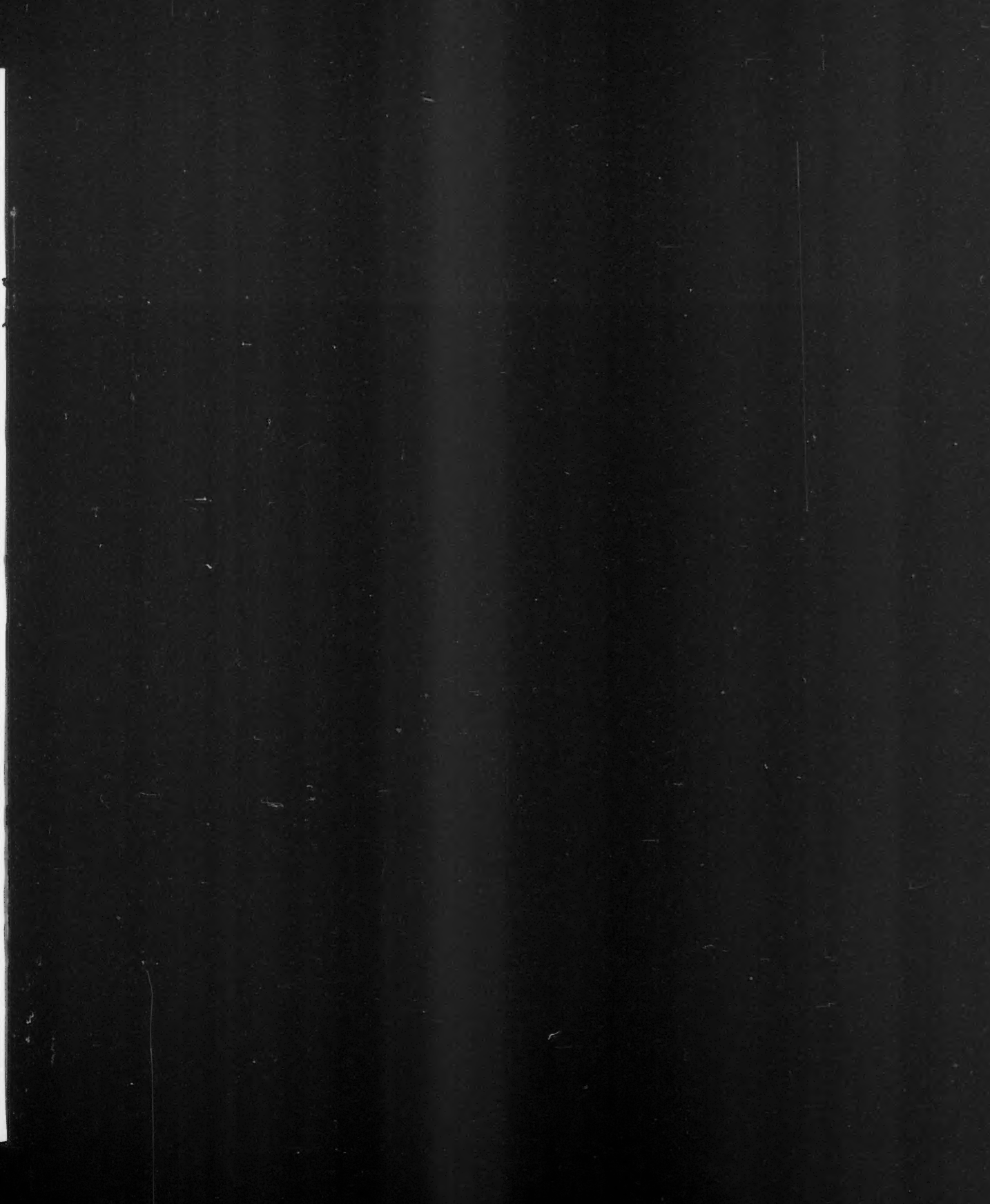
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TECHNOLOGY AND THE BOTTOM LINE

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NOVEMBER/DECEMBER 2001
VOL. 1 NO. 5

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SPECIAL ISSUE

HELP YOURSELVES

A SUPPLEMENT TO COMPUTERWORLD



- 1 This is the GAMER
- 2 That bought the System
- 3 That was sold by the Retailer
- 4 That linked to the Supplier
- 5 That notified Purchasing
- 6 That accessed the Data
- 7 That confirmed the Forecast
- 8 That anticipated the Order
- 9 That initiated the Process
- 10 That lives in the Integration Software
- 11 That we Built.

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TAKING STOCK



"If you want something done right, do it yourself." So my father was fond of saying when he did things like successfully smash the car trunk closed after loading it up with vacation luggage for seven people. What he could have said more accurately was, "If you want something done your way, do it yourself." ■ Today's banks, insurers, online retailers and others all tout serving yourself as the fastest and easiest way to get customized products and personalized services when and how you want them. Anyone who has ever used an ATM knows this to be true. Yet for many of us, other old habits, like dial-

ing up customer service or the human resources department, die hard. To help win over new do-it-yourselfers, smart companies are offering incentives, such as waiving delivery fees or discounting Web purchases, while saving millions in call center costs. This is just one of a dozen steps to doing self-service right, says Kathleen Melymuka, who wrote this issue's cover story, which begins on page 14. ■ But happier customers are just one of many potential benefits. Boosted sales are another. Writer Cindy Waxer found that shoppers on the Lands' End Web site who use the retailer's 3-D apparel-fitting feature ring up orders that are 16% larger than the average online customer (page 24). And Leslie Jaye Goff reports that PSS World Medical will save \$800,000 using a new Web-based self-service human resources system (page 18). ■ But when it comes to building a self-service system, forget my father's advice about doing it yourself. You may get it your way, writes John Webster in "Build vs. Buy" (page 26), but it's too expensive and time-consuming, and you'll likely get a faster and higher ROI from off-the-shelf applications. ■ That aside, for the most part, Father *does* know best. — Julia King

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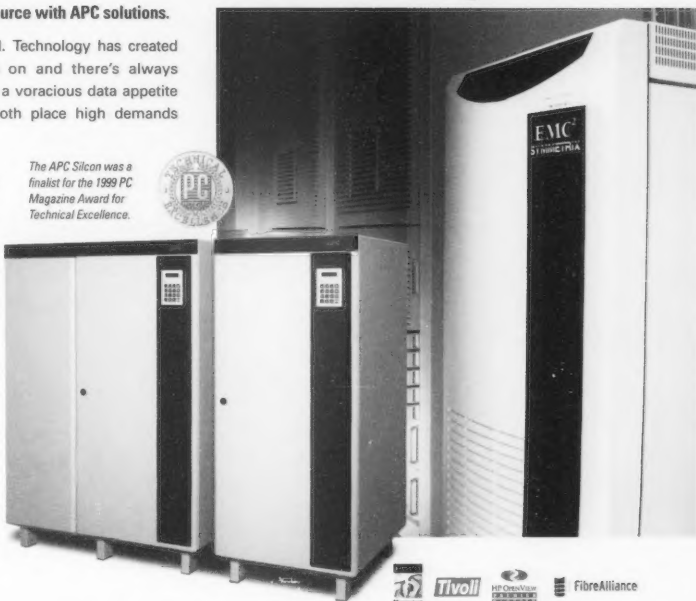
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TIPS, TACTICS AND TIMELY INFO ABOUT TECHNOLOGY PAYBACK



in demand IT Stars Require Premium Pay

THE ECONOMY MAY BE COOL, BUT SOME jobs are hot. Corporate IT professionals with "hot skills" — skills that are in short supply and high demand — are still getting pay and perks comparable to those in past years, according to consulting firm Hewitt Associates LLC in Lincolnshire, Ill.

IT specialties commanding the highest pay are deploying enterprise applications (and the resulting business changes) from PeopleSoft Inc. in Pleasanton, Calif., and SAP AG, Hewitt found in its study of 42,000 employees. Be prepared to pay these folks very competitive salaries and bonuses.

Other job skills on the hot list:

Hot Skills

- PeopleSoft
- SAP
- Microsoft

- Microsoft Corp.'s Exchange collaboration and messaging software

Employees with these much sought-after skills enjoyed an average increase in base pay of 7.5% in the past 12 months. And a word to the wise: These folks really like casual dress, ticket discounts and on-site ATMs.

clicks and mortar Online ROI: Looking Better

THE NEW MANTRA FOR PURE-PLAY INTERNET retailers is a laserlike focus on Web site sales and profitability. Most brick-and-mortar retailers use the same metrics for their Web sites — often with discouraging results.

But companies that factor in Web benefits along with sales — such as persuading consumers to buy at the company's traditional stores — will enjoy a much better ROI calculation, according to Jupiter Media Metrix Inc. in New York. "Nearly two-thirds of the total Web benefit for retailers will be in off-line transactions influenced by online research," says analyst Ken Cassar. The result: A Web site's ROI is 65% higher when nontransactional benefits are included.

There are other factors to throw into the ROI measure, such as cost savings from consumers doing much of the sales work themselves.

oops

Three Myths of E-Commerce

- 1. Consumers want to buy cars online. Reality:** 56% want to do some or all of their research online, but they don't want to buy online.
- 2. Young consumers flock to automotive Web sites. Reality:** Most visitors are over 35 years old.
- 3. Consumers want personalization. Reality:** Consumers ranked it last compared with other online attributes.

Source: Study of 1,000 North American consumers who visited automotive Web sites; Accenture Ltd., Hamilton, Bermuda

EDITED BY
MITCH BETTS



wired medicine Coincidence? We Think Not

THE NATION'S "100 MOST WIRED" hospitals and health care systems are more than just IT-savvy. They also seem to be more efficient.

A study by Deloitte Consulting in New York and *Hospitals & Health Networks* magazine in Chicago named the 100 Most Wired hospitals based on their use of online technologies to serve constituents. But then the researchers went a step further and examined some financial metrics. They found that the wired hospitals have significantly higher credit ratings, greater productivity and better expense control than unwired ones.

These are just correlations; it's hard to prove that IT actually created those benefits.

But CIOs at the wired hospitals say they're convinced IT is helping to improve not only efficiency but also patient care. The most wired hospitals are leaders in using IT for disease management, such as clinical decision-making and error reduction.

There's another perk to being known as a wired hospital. "Our hospital's success in changing its perception as just another rural hospital to a technology leader has helped to reduce patient migration to urban hospitals," says Dwayne Jordan, CIO at Rehoboth McKinley Christian Hospital in Gallup, N.M.

Wired Benefits

- Better credit
- Better expense control
- Greater productivity

talking head

"The situation now is that any 14-year-old with a grudge and a Web browser can shut down a Web site." — Purdue University security expert EUGENE SPAFFORD

the list Cheap Retail Site Fixes

10

- 1 Obtain misspelled versions of your domain name.
- 2 Don't make customers register with personal information.
- 3 Transform product photos to images that click through to a Buy button.
- 4 Showcase bargains with a link on the home page.
- 5 Make searches work the way customers think.
- 6 Ask manufacturers for product copy and images.
- 7 Show shipping costs and delivery times earlier in the process.
- 8 Promote on-time delivery to gift shoppers.
- 9 Analyze logs to uncover customer problems and address them.
- 10 Eliminate "404 Not Found" dead ends.

Source: Forrester Research Inc., Cambridge, Mass.

back to basics

New-Economy Tools Prove Disappointing

THE NEWFANGLED MANAGEMENT TOOLS — SUCH AS “market disruption analysis” and “corporate venturing” — that were hyped along with the New Economy are faring just about as well as dot-com stocks.

Executives who were asked what tools they use to manage their businesses say they’re relying on the tried-and-true techniques of corporate management: strategic planning, mission statements, benchmarking and outsourcing.

That’s the assessment of Bain & Co.’s eighth annual study of management tools. The survey of 245 executives found that respondents are opting for the classic tools by a 2-to-1 margin over the so-called New Economy tools, which had an average defection rate of 20%.

“The data shows that when the times get tough . . . managers fall back on widely understood tools that have been successful for them in the past,” says

Darrell Rigby, study director at the Boston-based firm.

For the record, *market disruption analysis* means identifying radical technologies or trends that threaten the core business. And *corporate venturing* means acting like a venture capitalist to invest in start-ups.



digital divide Widespread Dissatisfaction

Company executives who say they have realized the expected ROI from the following digital investments:

Customer relationship management systems **38%**

Enterprise resource planning software **31%**

Customer profitability tools **26%**

Source: Bain & Co. survey of 245 executives, November-December 2001. The survey was conducted by Bain & Co., Boston, Mass.



research roundup Around the World In 60 Seconds

■ E-mail addiction: 42% of workers check their business e-mail while on vacation. [Gartner Inc., Stamford, Conn.]

■ Three out of four companies will actually increase spending this year on customer relationship management, despite the economic downturn. [Jupiter Media Metrix Inc., New York.]

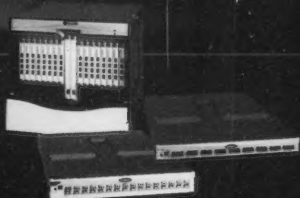
■ Six out of 10 women in high-tech jobs — citing the glass ceiling — say they would choose another profession if they were starting a career today. [Deloitte & Touche LLP, New York.]

■ More than half (52%) of CEOs report “major personal involvement” with e-business strategy and 23% report minor involvement. [Compass Publishing BV’s 2001 “World IT Strategy Census,” Reston, Va.]

■ The average job tenure of an IT professional is less than three years, and more than half of IT professionals change employers within that time. [People3, a Gartner company, Bridgewater, N.J.]

■ Eight out of 10 IT support staffers say they hate Mondays because they get bombarded with more help-desk calls than other days. [Support.com Inc., Redwood City, Calif.]

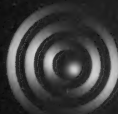
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BY THORNTON A. MAY

Sweeping a Path to Profitability

Customers will pay to help themselves to excellent service

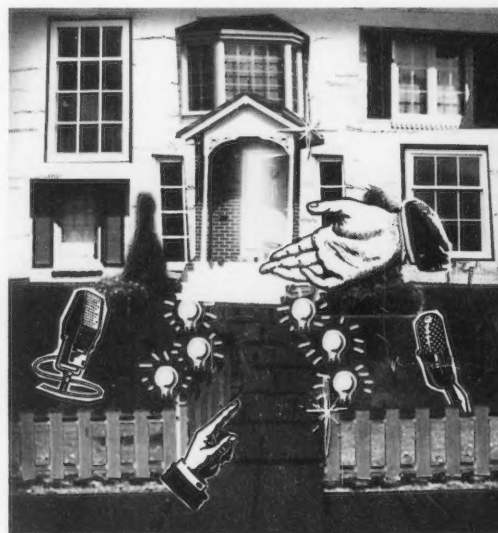
YOUR TYPICAL EXECUTIVE DOESN'T THINK MUCH about self-service. This is a costly mistake. My colleagues on the marketing faculty at the Haas School of Business at the University of California at Berkeley claim that the most strategic initiative in the enterprise today — and by far the highest payback activity of the modern marketing department — is creating a customer communication channel that delivers a service experience so exceptional you can charge, that's right charge, customers for the privilege of interacting with your enterprise.

Remember Tom Sawyer charging his friend an apple for the opportunity of whitewashing that fence? To migrate to a point where customer service makes you money instead of losing it will require a total executive mental repositioning. The cerebral housecleaning is well worth the effort. Making executives smarter is always a high ROI activity.

STEP 1: CLEAN THE BASEMENT We have to fix the mental foundation upon which high-payback self-service is based. Executives have to respect the intelligence of the customer. One of the most important "aha" moments associated with Dell's brilliant direct-to-customer self-service sales model was its belief (unlike everyone else in the industry) that customers are smart enough to configure and order PCs themselves, by phone or online.

STEP 2: PAINT THE FRONT DOOR, SWEEP THE WALK, LIGHT THE PATH We need to teach customers about how they will be better served by serving themselves. Old-think executives seriously underspend on customer education initiatives, feeling that customers — lacking Mensa-level cleverness — are untrainable. This is a global problem: Australia's environment minister, Iain Evans, is contemplating legislation that would make it illegal to pet white sharks. The government seeks to "protect people too stupid to protect themselves." Many of these safety-challenged people are smart enough to teach themselves how to use the Internet. Is your organization smart enough to make self-service attractive and to teach customers to serve themselves — and to pay you for it?

STEP 3: PLACE MICROPHONES IN YOUR YARD SO YOU CAN HEAR WHAT CUSTOMERS ARE SAYING Walt Whit-



man in "Song of Myself" wrote, "Now I will do nothing but listen." Corporate America spends \$5 billion a year for market surveys. They have outsourced listening. A self-service model drives your "listening costs" to zero, if the company captures the information.

STEP 4: LET THE CUSTOMER DESIGN THE HOUSE Active listeners are hearing their customers say four things: "I want to talk to someone who listens to me"; "I will only buy products or services that are personalized for me"; "I want to know that our 'conversations' are secure and private"; and "When I trust that you know who I am, can keep my information safe, and can use what I tell you to delight me, I will turn over my purchasing decisions to you."

Despite being born in an age when we don't have to hunt for our own food, sew our own clothes or cart away our own waste, we aren't strangers to self-service. Deep down, we even like the concept. We just have been overwhelmed with its execution.

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- Model 1000 (40GB) \$499

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BY NINA LYTTON

Peering Down the Pipeline

How one large corporation wins and delivers new business

IN A RECENT CROSSROADS-OSA POLL OF 200 EXECUTIVES, 71% identified "business alignment"—bringing together people and technologies up and down the chain of command, across locations and with business partners—as management's primary lever to deliver business results.

In rapidly changing markets, aligning the efforts of employees in a large corporation is more easily said than done. It's no small feat to encourage decentralized decision-making while maintaining strategic alignment. Executive management must not only set the course, but it must also provide staff members with a means to trim the sails.

Take IBM, for example. To meet its internal and external alignment challenges, the company is overhauling the way its employees and partners access information with a new business-intelligence system. Custom-built by IBM Global Services, it gives staffers access to the data they need to understand the pipeline, close deals profitably and measure customer satisfaction.

Susan Whitney, an IBM general manager, was an early driver of the project and is now a beneficiary. "It's effective for three reasons: comprehensiveness, data quality and relevance to people's jobs," she says.

For example, the system provides an end-to-end view of the marketing, sales and fulfillment process. Customer data coverage starts with prospects' responses to ads. Sales representatives' reports of customer requests for information and proposals are tracked when partners are involved in the process. When customers are working with IBM's Global Services or another integration partner, that data is also visible. Tracking continues through product or service delivery. Status is subsequently monitored through IBM's customer surveys and augmented by reports

from sales reps and managers. The payback? Just look at IBM's stock-market performance in this difficult economy compared with that of its major rivals. And in volatile times, IBM has better information to respond.

Data quality is a make-or-break factor. Top management must push for consistent definitions and timely, accurate data collection companywide. Otherwise, organizational entropy causes divisional efforts to fragment.

IBM's approach is a textbook example of best practices

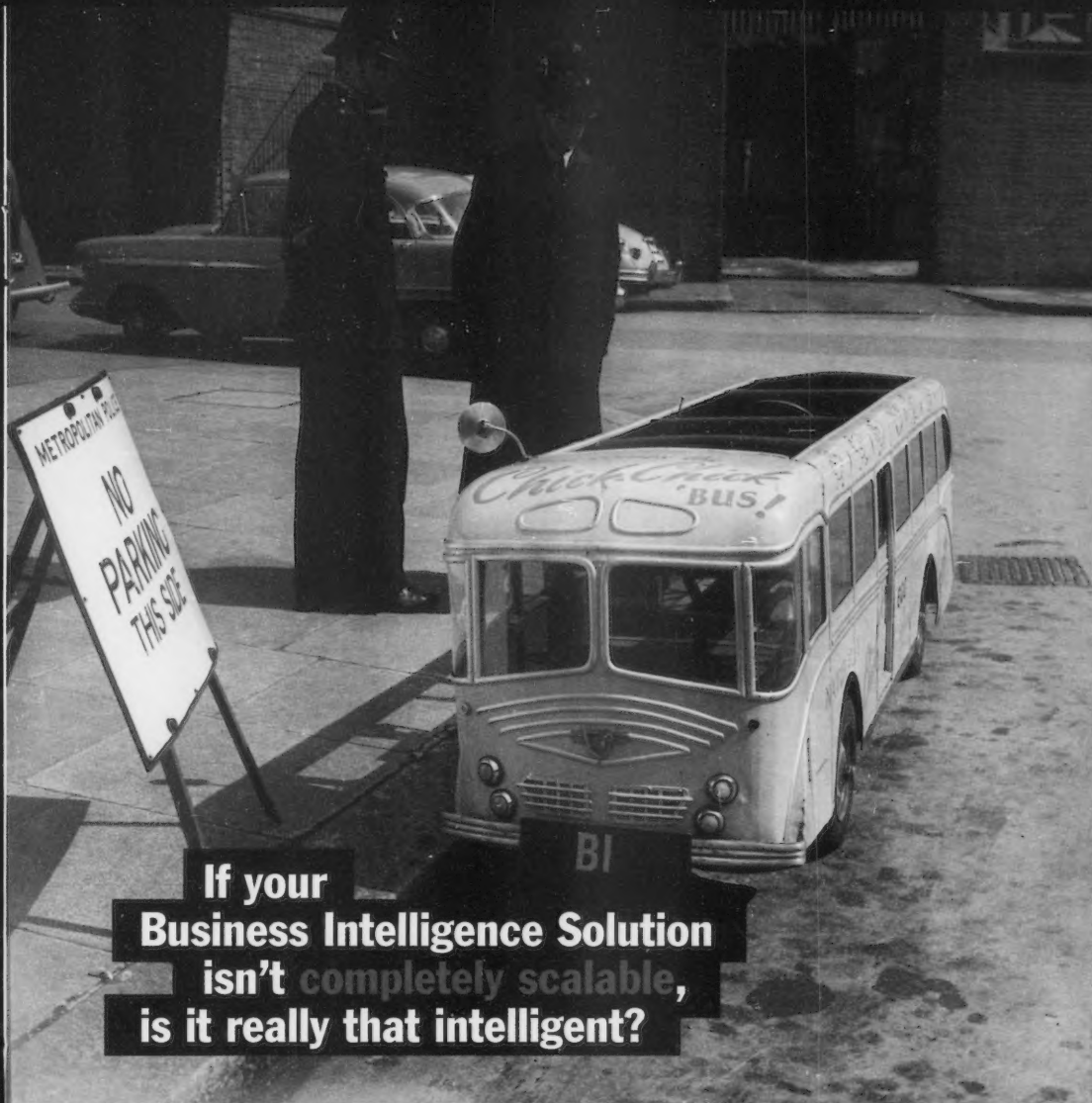
in business intelligence and operational decision support. Empowering employees with self-service access to information required the system designers to think beyond the typical executive-information system. Because tens of thousands of people use the IBM system daily, it was built to offer something for everyone.

The self-service system complements IBM's weekly review of the pipeline by industry, geography and platform. Regular meetings with successively higher levels of management serve as a forum to identify, manage and escalate issues. For example, eServer group executives use the system each week to fine-tune decisions about allocating product investment dollars, marketing budgets and sales resources. This helps IBM invest for maximum effectiveness.

But to emulate IBM's results, an organization must replicate its commitment. It isn't sufficient to gather accurate data on the whole business cycle and make it conveniently accessible to executives, employees and partners in a self-service mode. Management's use of the information to make decisions and take action must be as disciplined and rigorous as the data's technological underpinnings.

ROI





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MAKING SELF-SERVICE PAY OFF¹²

KEY STEPS



SELF-SERVICE IS A PRETTY simple concept: Enable your customers to accomplish their goals without human intervention. You don't spend

dollars on phone calls; your customers find what they need themselves for pennies and don't have to wait in a phone queue. It's a win/win situation. You make your customers happy, and everything else falls into place.

So, why are so many companies failing miserably at self-service? In a recent survey by Cambridge, Mass.-based Forrester Research Inc., 62% of respondents said self-service is their most important customer initiative, yet 41% have seen no return on investment. No wonder: Lots of self-service sites are awful — so awful that 62% of online shoppers have given up

at least once, according to Creative Good Inc., a New York-based consulting firm that specializes in customer experience.

The companies that make self-service easy succeed, and success can mean millions in savings. Here's how they do it.

1. FOCUS ON YOUR CUSTOMER

"CUSTOMERS DON'T WANT TO UNDERSTAND e-business; they want e-business to understand them," says Mark Carpenter, director of Web strategy and operations at AARP Services Inc., a for-profit subsidiary of AARP in Washington.

The MyAARP site lets members customize services by answering questions about their interests. Members interested in health care and vacation spots, for example, will find those topics front and center when they log on. The hope is that the site will be so useful, members won't need to

PHOTO BY SILVIA OTTE

call the company for the information.

"It sounds too fundamental, but we struggled to discover who our customer is," says Mark Farrell, director of the individual annuity call center at Columbus, Ohio-based Nationwide Financial Services Inc., the third-largest provider of individual annuities and 401(k) plans in the U.S. Nationwide's customers include retail investors, brokers and third-party administrators. Farrell identified what each set of customers wanted to achieve and customized the site for each.

For example, brokers wanted sales materials, while retail customers wanted information about their investment accounts. Based on the number of phone calls deferred, Farrell estimates that the site has saved 8% to 15% of the total contact center budget, though he's still improving ROI metrics.

BY KATHLEEN MELYMUKA



2. DESIGN TO SKILL LEVEL

RICH HARKWELL, VICE PRESIDENT OF CUSTOMER EXPERIENCE SOLUTIONS at Nexstar Financial Corp. in St. Louis, knows that customers who come to Nexstar's site with financial inquiries tend to do so from their offices, where they have multiline connections, so he correctly predicted that they would use a chat option. AARP's Carpenter knows that his customers tend to use home PCs with limited capabilities, so his site doesn't use multiline features.

Understand that even a great site won't work for every customer. Chris Martin, senior manager of the strategy group for Americas Online at Dell Computer Corp. in Round Rock, Texas, works with Dell's Premier site, which provides services to IT professionals who support business users. Martin has saved \$15 million to \$20 million by shifting 60% of those contacts from the phone to the Web.

As IT professionals, Martin's customers are probably more amenable to using the Web than other self-service tar-

get groups. But even so, Martin says, letting customers choose is key. "You need to give customers choices — Web, e-mail, phone — then make low-cost choices at least as attractive as the rest," he says.

3. KEEP IT SIMPLE

ACCORDING TO CREATIVE GOOD, THE Internet user base doubles every 12 months, so there's a 50% chance that a given visitor to a site is a relative novice. Therefore, says Carpenter, "don't make critical things dependent on bells and whistles." AARP uses 128-bit encryption that doesn't work with the older browsers used by 10% of AARP members. So when the site detects an older browser, it automatically downgrades to 40-bit encryption, an accommodation achieved at very little cost to AARP.

4. START SMALL AND IMPROVE

SENIOR VICE PRESIDENT AND CIO TRICIA Trebino knew that each day, more than 500 members of Tufts Associated Health

Plans Inc. were calling about the status of their claims. That was one of a few "can't miss" features built into the first iteration of the Waltham, Mass.-based company's self-service site. "Then, as people gained familiarity with using the site, we got a lot of feedback and suggestions for more things to incorporate, so we've increased functionality, release by release," she says.

Sears, Roebuck and Co. in Hoffman Estates, Ill., has also been guided by customers, says Kevin Callahan, a vice president at the retailer. Feedback indicated that 15% of customers at Sears' Parts Direct site wanted to order parts online but pick them up locally. "Our customers are ahead of us. We're trying to catch up" by letting them tap into the inventory of 500 local service centers, says Callahan.

5. BEFRIEND YOUR CALL CENTER

MANY IT VETERANS AGREE THAT MANAGEMENT buy-in at the call center is critical to self-service success. But getting buy-in can be tricky. "Contact center man-

MEASURING SUCCESS



ETRICS-CONSCIOUS COMPANIES LIKE POLAROID track the cost incurred for support on every product they sell. For example, support for Polaroid's digital cameras cost \$4.50 per unit in 1999. Last year, after the inauguration of its self-service site, that cost fell to \$1.50. The savings may be attributable to other factors, but last year, Polaroid sold 1.3 million digital cameras and saved \$3.9 million in support costs over 1999.

Polaroid also looks at the tricky question of what percentage of Web visitors are successful in getting the information they need. Last year, there were about 700,000 visitor sessions on Polaroid's self-service site. About 35,000, or 5%, were followed up with questions via e-mail, indicating that the customers hadn't found the information they needed on the site.

"It could be that 95% of our Web sessions were successful,"

says Yale Cohen, general manager, "but we don't buy that." Through customer surveys, Cohen has estimated more conservatively that 40% to 50% of online sessions are successful. So, estimating that 250,000 of the 700,000 sessions save a phone call at \$8 per call, that's about \$2 million in savings. (Polaroid filed for Chapter 11 bankruptcy protection in mid-October, after this story was reported.)

The final factor is revenue generated by service contacts. When a customer goes online to ask why his batteries run down so quickly, the automated answer will inform him that he can buy rechargeable batteries and that he can "click here" for more information. Cohen says he believes that sales from this kind of initiative will be an increasingly important part of the site's ROI, but the site's not integrated with sales well enough yet to measure its success.

— KATHLEEN MELYMUKA

agers may feel threatened by the goal of cutting phone call volume," says Rob Nelson, senior manager for global e-business operations, effectiveness and integration at Motorola Inc. in Schaumburg, Ill. He suggests explaining to managers that offloading calls lets agents focus on more challenging issues and even shift into revenue-generating activities, such as cross-selling.

Motorola Direct, the company's retail self-service site, was phased in during the past year and has already saved 8% to 10% of the total contact center budget.

The call center staffers will have to undergo an evolution in skills to support self-service channels effectively. They may be great on the phone, but they'll also need to develop writing, typing and technical skills. They'll need to not only solve traditional customer problems, but also to extract callers from Web site glitches and instruct them on how to get it right next time, according to Farrell, who allocates about 4.5% of his budget to such training.

6. BUY, DON'T BUILD

IF YOUR SITUATION ALLOWS IT, BUYING beats building. In-house development takes longer, and it can leave you with integration problems.

"There are so many potential modules that the complexity of integration will be greater and greater," Nelson says. "Go with a company that can help you integrate new things online as they come along."

7. TRUST, BUT VERIFY

APPROACH VENDORS WARILY. "BUILD A business case for self-service, and beware of vendors who want to sell you more than your business case requires," Nelson says. For example, if your business isn't likely to generate sales using chat, resist that vendor pitch.

8. INTEGRATE YOUR CHANNELS

AVOID CHANNEL SILOS. "LOOK AT THE entire process from end to end in all the impact areas," says Nelson. For example, if customer channels are running from different back-end systems, you may find different inventory status, pricing or shipping charges. Use a cross-functional team to iron out the back end so that all channels are presenting one story and one face to the customer.

Integrate the contact center as well, so you can shift workloads among agents.

9. MARKET YOUR SITE

"YOU HAVE TO EDUCATE PEOPLE AND REALLY demonstrate value," Trebino says. Tufts sells its site through wholesale advertising, articles in provider bulletins, recordings that play while customers wait in phone queues and through phone agents themselves. If a provider expresses interest, Tufts sends a support team to explain the site's benefits and demonstrate its use.

You may also want to experiment with an incentive like waiving delivery fees or discounting prices on Web purchases. But if you do, make it clear that it's an incentive, not a failure in communication between channels. One way to do this is to use other channels, such as phone representatives, to advertise Web discounts.

But even with marketing, "you can't count on changing behavior overnight," says Trebino. "Initially, you don't see any ROI. We got more calls because people were trying to understand how it worked." After a year online, Tufts is just starting to sense a drop in calls, although hard measurements have yet to be taken.

10. USE WHAT YOU LEARN

WHAT YOU LEARN THROUGH YOUR self-service site can make a difference in customer satisfaction and other areas, but only if it's passed along to the right peo-

ple. Motorola Direct recently got lots of calls about a 56K bit/sec. modem. That information was passed along to manufacturing, and a previously unseen glitch in the product was found and corrected.

"Establish processes for information flow and communication, so you can get that information back to the functional owners who can do something about it," Nelson says.

11. BUILD RELATIONSHIPS

ONE OF THE CENTRAL PARADOXES OF self-service is that the better it works, the more distant the customer relationship becomes. "You're trying to get away from the cost associated with contact, but when you miss out on the contact, you're missing out on important information about who your customers are and what they want," says Yale Cohen, a group manager at Polaroid Corp. in Cambridge, Mass. "You have to use [self-service] to build the relationship, not to sever the connection."

Polaroid is addressing that by using customer data to evolve its self-service sites into centers for cross-selling and upselling. For example, a customer with a service need might also be a candidate for an upgrade, so the system will invite him to purchase or switch to another channel for more information, increasing interaction, personalization and revenue.

12. MEASURE YOUR ROI

"YOU ABSOLUTELY NEED AN ROI ANALYSIS," says Nelson. "You have to clearly identify deliverables that you can measure."

You can estimate the cost of a phone call vs. a site visit and measure how much volume you move from the phone to the Web. You can figure out what constitutes a successful Web encounter and measure the success/failure rate of self-service.

"If you can't measure it," says Nelson, "don't do it."

ROI

ILLUSTRATION BY ION CANNELL

SIGNATURE

EXPORTER (complete name and address)

Visa

Balances

9

249



(complete name and address)



560-700

567-000

Nº 74

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3

Registered

WORKERS SEEK AND FIND JUST WHAT THEY NEED FROM SELF-SERVICE: UNIVERSES OF CUSTOMIZED INFORMATION

BY LESLIE JAYE GOFF

bECAUSE OF HUMAN RESOURCES snafus, as many as 2,000 employees — or about 35% of its 5,000-person workforce — were leaving PSS World Medical Inc. each year. And many of those workers were leaving within just a month of hire.

The Jacksonville, Fla.-based medical supplies company required new workers to fill out 17 separate forms. The human resources department processed about 85,000 pieces of paper annually, including forms for insurance enrollment, vacation requests, tax withholdings and payroll.

As often as not, those forms were getting lost in the shuffle, according to Jeff Anthony, senior vice president of corporate development. The result: New hires sometimes went unpaid or were denied insurance coverage because their initial forms

weren't processed correctly. "HR was one of the most poorly performing departments in the company," Anthony says bluntly. "And I should know, because I've been here 11 years."

To stem the tide of paperwork and employees, PSS World Medical rolled out a Web-based, self-service human resources system outsourced from Employeease Inc., an Atlanta-based application service provider. Now, new employees have to sign only four pieces of paper. Working with their managers, they fill out the rest online, and the time for processing new hires has been cut drastically, from seven to 10 days to less than an hour.

PSS World Medical is one of a growing number of companies turning to self-service applications to cut costs, reduce paperwork, streamline processes and increase productivity. By enabling employees to conduct their own online transactions — from updating HR information to buying supplies and booking corporate travel — these companies are easing managers' day-to-day burdens, capturing information about their workforces, getting

more out of their intranet investments and even generating incremental revenue.

Taken together, the measurable hard-cost savings and the harder-to-quantify improvements in operations generated by self-service applications can yield a considerable return on investment, users say.

In particular, self-service human resources applications have caught on at large companies because employees see them help reduce costs and streamline processes, as well as offer employees a convenience that creates buy-in to the self-service concept. A first-quarter survey of 100 Fortune 500 companies by human resources consulting firm Towers Perrin found that HR applications are among the most common self-service packages: 60% of respondents said they allow employees to complete benefits enrollment online, 80% enable 401(k) allocation changes online, and 43% allow employees to change their personal data online.

Hewlett-Packard Co. has embraced

AT THEIR FINGERTIPS

self-service HR as part of a companywide effort to reduce infrastructure costs by \$1 billion over two years. The applications, rolled out last fall, are part of a full-blown business-to-employee portal that, in addition to handling HR functions, lets employees purchase supplies and, eventually, plan and schedule their own business traveling. The manufacturer's portal, dubbed @HP, has corralled 4,700 separate intranet sites into 180, while extending uniform self-service transactions to all employees across the company based on their individual roles.

"We could have taken the traditional route of looking for more cost efficiencies and gone through a traditional cost reduction process," says Barry O'Connell, general manager for HP's business-to-employ-

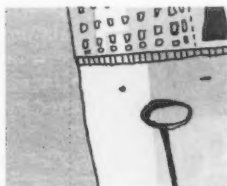
reported that benefit enrollment transactions are more accurate online. The ROI that can be drawn from increased HR accuracy can be significant, including cost reductions, productivity improvements and higher employee retention.

PSS World Medical expects to reap \$800,000 in savings this year from its new self-service system. That's because the company's previous human resources snafus were creating tremendous overhead. For example, lost paperwork generated astronomical overnight-mail fees, as the company rushed to appease disgruntled new hires who hadn't received their first paychecks, Anthony says. When employees left the company, HR often couldn't prove whether they had taken their vacation time, so the company ended

tions and reductions in printing costs, next-day air fees and other overhead; \$250,000 in productivity improvements in branch operations, resulting from reduced management headaches; another \$100,000 in payroll savings from getting employees out of the system as soon as they leave the company; and about \$200,000 in legal costs, which he declined to specify.

The company originally planned to build its own human resources system, but Anthony, who was formerly the company's CIO, opted to outsource to start getting an immediate ROI.

"To go from having no system to having one without spending 12 to 14 months implementing it had a lot to do with that decision," he explains.



THE MORE A SELF-SERVICE SYSTEM DEPENDS ON
AN EMPLOYEE'S VOLUNTARY PARTICIPATION,
THE MORE NEBULOUS THE ROI.

ees solutions. "But we thought it better to use the Net as a tool to change the way we run the business. Just as the Net has changed B2B and B2C, we wanted to look at the processes we manage internally and [how they could be improved] if we had a direct connection with employees."

With an overall investment in the portal of about \$20 million so far, the human resources components alone have saved the company an estimated \$50 million, O'Connell says.

Giving employees online access to human resources processes takes a lot of pressure off the HR department and increases the accuracy and timeliness of employee data, Towers Perrin found. More than 75% of the survey respondents

up cutting a check for it. Because of manual processing delays, PSS World Medical continued to pay insurance fees for employees after they were gone.

"It's very unprofessional to lose an employee's paperwork and not be able to pay," says Gil Howie, a PSS World Medical project manager in Louisville, Ky., who has seen his share of employees leave in a huff. "I don't think we'll ever have any more lost paperwork. It has made my life as a manager much easier."

PSS World Medical paid \$20,000 upfront to join the Employeas Network and pays a monthly usage fee of about \$17,000. The \$800,000 Anthony expects to save includes \$250,000 in hard savings from the elimination of certain HR posi-

"We're already going through a J.D. Edwards system [implementation] to support the business, and we didn't need to add another major development project on top of that," Anthony says.

Companies that have had measurable success in transaction-oriented self-service applications are starting to experiment with other high-end self-service tools. New York-based public relations firm Hill & Knowlton Global, for example, has implemented a self-service knowledge management system to increase collaboration across the firm by connecting the right people with the right information at the right time.

Instead of spending time thumbing through a Rolodex or shuffling through

business cards collected at the last company picnic, Hill & Knowlton's 1,900 employees can use pull-down menus or keywords to find the talent, skills or knowledge they need from colleagues spread across 66 offices in 35 countries.

Hill & Knowlton employees create and maintain personal folders in which they store information about their professional experience, expertise, hobbies and extracurricular activities. Then, when an account executive needs a specialist in crisis management or a rundown on health care industry regulations, a quick search yields employees with matching credentials. The system also captures team e-mails and documents that contain critical information about clients and projects.

Intranet use at the firm has grown sevenfold since Hill & Knowlton rolled out the system. Before, the most commonly accessed document on the intranet was the vacation request form, notes Ted Graham, worldwide director of knowledge management services.

"We have a slimmed-down research department, so our employees do a lot of self-service research," says Graham. "Before the knowledge management system, they would search the much larger universe of the Web, and that's OK. But if you can search your own intranet, that will get you the critical pieces you need much faster."

Some internal Hill & Knowlton measurements suggest that employees are absorbing the knowledge they need about clients and industries in about one-third the time it once took them, Graham notes. But, in general, the more a self-service system depends on an employee's voluntary participation, the more nebulous the ROI.

For example, whether employees are finding people and resources that they wouldn't have found otherwise is difficult

WHERE TO START

Key self-service applications for employees include the following:

- Online benefits enrollment
- Online 401(k) allocation changes
- Changes to personal data
- Companywide electronic Rolodex
- Employee skills database

to determine, Graham says, as is whether the increased intranet usage translates into increased productivity. So arriving at a specific ROI for the system, which was co-developed with Brisbane, Calif.-based Intraspect Software Inc. at a cost of about \$400,000, is largely anecdotal.

"I could say our people bill out at x dollars per hour, so if the system saves them two weeks of billable time in research on a project, that's the ROI factor," Graham says. "But I report directly to the CEO, and . . . it's more important for him to hear from the head of Ernst & Young that they purchased our services because we differentiated ourselves with this [system]."

But Graham can partly quantify the ROI based on incremental revenue the system is generating. Since the system captures project and client information, Hill & Knowlton can create branded extranets that enable clients to review their press releases, communications and other documents at their leisure. The company charges \$4,000 each for the extranets.

"I would say we have made the investment back at least twice, including productivity gains and revenue from extranet sales, as well as some clients we wouldn't

have gotten otherwise," says Graham.

HP also has found that quantifying the ROI on self-service applications is an inexact science. Aside from specifying the \$50 million in human resources-related savings, O'Connell would say only that the company is on track toward meeting its goal of \$1 billion in cost reductions.

While the company is deriving part of those savings directly from the self-service HR applications, other savings come indirectly from the information that HP can capture from those applications, he says. For example, by analyzing workforce data collected in the human resources applications, HP has been able to reduce real estate costs. Since workers who are primarily mobile, such as the sales force, can now conduct office-related business from anywhere at any time, the company has closed or reduced the physical size of some offices. It also has been able to shut down a number of internal call centers.

"We were diligent about understanding what processes we would be changing and how much those processes cost to manage and administer, and understanding the cost reductions from the changes," O'Connell says. "But some parts of the ROI are more tangible than others." ROI

OLD HABITS DIE HARD

BARRARA KELLY WASN'T ABOUT TO LET A \$250,000 investment in self-service technology at Blue Cross and Blue Shield of South Carolina go to waste.

As vice president of human resources, she had spent four long months overseeing the health insurer's implementation of a Web-based software system that lets employees perform tasks such as making coverage changes to medical plans and updating emergency contact information with the click of a mouse.

The goal was to move the Columbia, S.C.-based firm from paper-predicated mayhem to browser-based efficiency. But Kelly knew that success ultimately hinged on eliminating employee apprehension. While senior-level executives could be counted on to make the transition from pen to mouse, employees ranging from cafeteria workers to claims processors were also expected to embrace the company's self-service tool — a tall order for traditionally technophobic personnel.

Such is reality for countless companies eager to realize a fast return on their self-service initiatives. Human resources management portals, instant messaging, speech recognition systems, corporate intranets, kiosks — they're all applications that can cut down on paperwork, increase customer loyalty, and reduce call volume and labor costs.

Yet many businesses are failing to persuade users to make the switch from human-powered channels, such as the telephone and e-mail, to self-service. The fact is that 17% of companies are experiencing an increase in call center traffic concurrent with their self-service offerings, according to Forrester Research Inc. in Cambridge, Mass. Unable to reset consumer habits, these companies also risk losing revenue, employees and customers.

HOW TO GET USERS TO HANG UP AND LOG ON

BY CINDY WAXER

PHOTOGRAPH BY ANN STATES

At Blue Cross, the introduction of the Web-based software system required meeting with the insurer's call center operators to prepare them for an anticipated influx of technology-related questions.


So how are companies persuading consumers and employees alike to break with old habits?

At Blue Cross, a PC loaded with WebServe software from Methuen, Mass.-based Genesys Software Systems Inc. was placed in each of the company's 100-plus human resources offices. While human resources personnel lay claim to their own computers, these communal PCs, scattered throughout the organization, guarantee system access to all 14,000 employees.

Fifteen-page booklets containing screen shots of the software, along with step-by-step instructions, were distributed to mollify the technophobes. And senior-level managers participated in 20-minute training sessions so that they might later assist others. But it was the decision to do away with paper-based open enrollment processes that truly drove the adoption of self-service, Kelly says. The insurer's benefits enrollment process takes place once a year. When it came time to introduce its WebServe program last year, Blue Cross simply halted all paper filings, leaving employees with no choice but to make changes to their medical plans electronically.

"I'm a firm believer that if you tell employees [that processes] are going to change, everybody changes. You just bite the bullet one time, otherwise you're living with [a mess] for years," says Kelly.

It's a system overhaul that has proved beneficial to employees and human resources managers alike. Performed manually, Blue Cross' enrollment process entailed days of delivering paperwork from one department to the next, mailing additional forms,

A black and white photograph of Barbara Kelly, a woman with short, light-colored hair, wearing a dark blazer over a patterned top and a pearl necklace. She is holding a large, vintage-style telephone receiver in her right hand, raised towards her face. The background is a plain, light color.

Barbara Kelly, vice president of human resources at Blue Cross and Blue Shield of South Carolina, wants less talk, more clicks.

phoning employees to verify information and the dedicated assistance of four human resources personnel. WebServe, on the other hand, eliminated the need for shuffling forms between departments and mounds of paperwork, reducing the process to a mere 10 minutes.

Pitching self-service applications to customers, however, is an art that requires equal parts prodding and finesse. Take Lands' End Inc., for example. The Dodgeville, Wis.-based retailer still fields plenty of phone calls and e-mail from shoppers inquiring about how its apparel is sized. But it says conversion rates increase 19% when online consumers make use of the Web site's My Virtual Model, a self-service feature that lets customers dress a 3-D model, based on actual physical measurements, with any number of outfits.

Launched in 1998 and now used regularly by more than 10% of Lands' End's 38 million annual online visitors, My Virtual Model also accounts for a 16% increase in an average online order. It's a self-service success story that Terry Nelson, e-commerce marketing manager, says results from resetting consumer behavior patterns by catering to customer demand.

After all, My Virtual Model delivers a chance for visitors to feel as if they have actually tried on an item of clothing. And it's precisely this ability to address a real customer need that has helped drive its adoption, Nelson says.

The bottom line: Give your customers the Web-based self-service tools they want, and eventually, they'll hang up the phone and log on.

ROI

LET VENDORS WAX POETIC ABOUT DETAILED ROI CALCULATIONS AND in-depth case studies. These days, most user companies are sizing up their self-service initiatives with anecdotal evidence rather than mind-boggling statistics.

It's an understandable approach, given the absence of any one universal formula for calculating ROI. Unable to precisely match dollars spent with pennies saved, businesses have turned their attention from chasing elusive mathematical metrics to relying on soft measures, such as customer satisfaction and employee confidence.

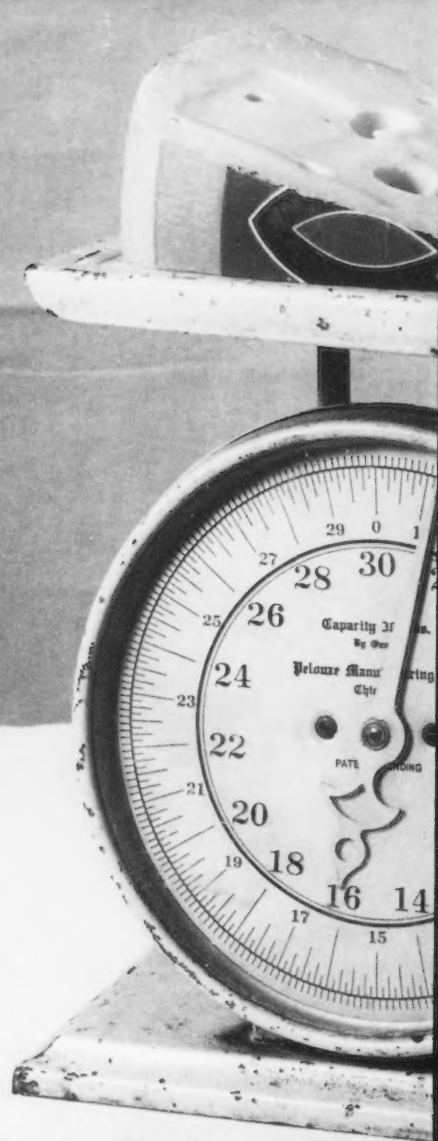
Doug Haniford, marketing manager at Pittsburgh-based Giant Eagle Inc., has been tracking the grocery store chain's introduction of self-service deli-counter kiosks, which let shoppers electronically place orders and pick them up within minutes. Haniford says it was the added convenience of the ordering system that ultimately determined the kiosks' winning status. The kiosks are now up and running in three of the chain's 210 stores, and the company has plans to install about 20 more.

Convenience is a measurement that's far less tangible than that of increased sales, Haniford notes, but it's one that allows for a broader snapshot of the benefits to be reaped from self-service applications. By focusing solely on sales boosts, Giant Eagle would have been limiting its assessment to numbers that rise and fall with seasonal traffic, geographic location and in-store promotions.


Meanwhile, past experience indicates that a convenient, stress-free shopping experience tends to result in increased transaction size, reduced labor costs, lower attrition rates and improved flow of in-store traffic — byproducts that make for a more comprehensive estimation of success, Haniford says.

Still, convenience as criteria has meant relying on measurement tools other than sales reports. It's for this reason that each kiosk is accompanied by a trained representative who shows customers how to place electronic orders and solicits their feedback, which is relayed to store management.

That's not to suggest that all self-service applications are best measured in accordance with all-encompassing criteria. In the case of 3Com Corp., a



BY THE N



ROI METRICS MAY BE INTANGIBLE, BUT THEY AREN'T INCALCULABLE BY CINDY WAXER

Santa Clara, Calif.-based networking vendor, increased productivity and reduced cycle times are measurements that play a lead role in ROI metrics.

In August 2000, 3Com began implementing a Web-based compensation program that enables managers to access and update information on employees' base pay, stock options and bonus packages. It's a self-service application that has proved superior to 3Com's previous system, which required managers to use Excel spreadsheets to chart changes such as annual salary increases. Says Neil Nesenblatt, the company's director of human resources information systems: "It was a very labor-intensive process to cut and paste spreadsheets and distribute them throughout the organization."

But now, reviewing an employee's pay increases, promotions and overall performance with the click of a mouse has enabled managers to reduce the time they spend arriving at pay and stock recommendations from 15 hours to less than an hour per employee. Because 3Com's assessment of its self-service application also includes a data-quality metric, the system pools information ranging from employment history to budgetary provisions, which means managers no longer need to flip between spreadsheets. That narrows the margin for human error. In fact, Nesenblatt says, 3Com's data auditing process, which used to consist of "a week of all-nighters," has been whittled down to less than a day.

Paul McKeon, partner and chief e-business officer at Ketchum, a New York-based unit of Omnicom Group Inc., also includes abstract ROI metrics in his self-service assessments. For example, measuring the success of the communications firm's intranet has meant gauging customer and employee satisfaction.

McKeon says one of the self-service system's biggest benefits is its ability to build confidence levels in employees and clients alike. Accessed by more than 1,000 employees worldwide, the intranet has created a stronger sense of community, encouraging employees to brainstorm on client accounts. Says McKeon, "The [self-service] project wasn't initially justified on a pure ROI, capital-return model. It was based on the fact that we wanted our people smarter, we wanted them faster, we wanted greater customer satisfaction."

ROI

PHOTOGRAPH BY JOHN SOARES

NUMBERS

LET VENDORS WAX POETIC ABOUT DETAILED ROI CALCULATIONS AND in-depth case studies. These days, most user companies are sizing up their self-service initiatives with anecdotal evidence rather than mind-boggling statistics.

It's an understandable approach, given the absence of any one universal formula for calculating ROI. Unable to precisely match dollars spent with pennies saved, businesses have turned their attention from chasing elusive mathematical metrics to relying on soft measures, such as customer satisfaction and employee confidence.

Doug Haniford, marketing manager at Pittsburgh-based Giant Eagle Inc., has been tracking the grocery store chain's introduction of self-service deli-counter kiosks, which let shoppers electronically place orders and pick them up within minutes. Haniford says it was the added convenience of the ordering system that ultimately determined the kiosks' winning status. The kiosks are now up and running in three of the chain's 210 stores, and the company has plans to install about 20 more.

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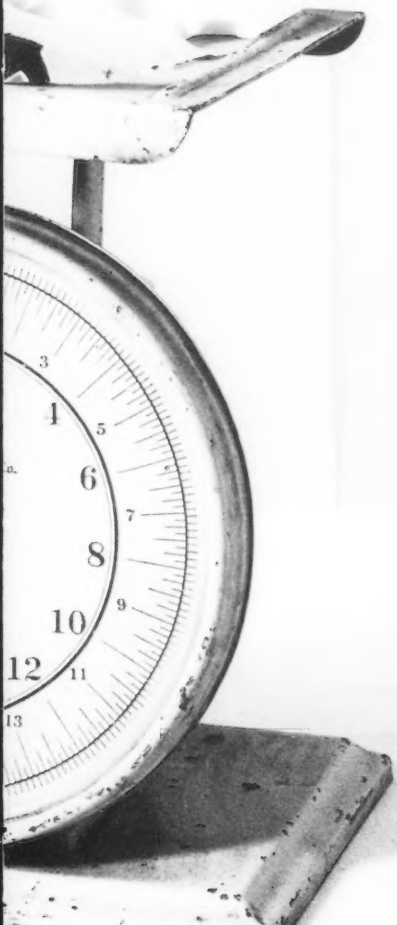
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ROI

PHOTOGRAPH BY JOHN SOARES

NUMBERS



BUILD vs. BUY

B

UY IT OR BUILD IT? WHEN IT COMES TO SELF-service applications, the answer isn't so easy. To cut costs, companies are moving away from the call center. Instead, they're putting the bulk of their customer- and partner-assistance services on the Web and other self-service platforms, such as interactive voice response systems (IVR) and so-called virtual agents that can respond via e-mail.

But until recently, no single vendor could offer companies exactly what they needed. This situation has improved somewhat with better tools to integrate legacy systems and customize off-the-shelf software, but many firms are still doing a lot of development in-house or cobbling together custom and store-bought software.

Just ask Terry Povey, director of Web business development at Blue Cross and Blue Shield of South Carolina in Columbia, an

early adopter of Web-based self-service. In 1999, the organization set out to deploy an application that lets its members and physicians electronically access benefits, claims and health information.

At the time, Povey found that her IT staff would have to do most of the development — and many other companies were discovering the same thing. Indeed, nearly half of the 42 companies surveyed last May by Cambridge, Mass.-based Forrester Research Inc. reported that they had developed their own self-service applications, citing the immaturity of products available when they began their Internet initiatives.

"We saw a business opportunity for this software, but when we decided to launch it, there was nothing available off the shelf. And there's still nothing," says Povey.

PHOTO ILLUSTRATION BY DAVID POHL



WEB AND TELEPHONE SELF-SERVICE SOFTWARE HELPS PUT CALL CENTER COSTS ON HOLD **BY JOHN WEBSTER**

Luckily, the company had enough in-house expertise to create its own Web application, called My Insurance Manager. But Povey had to look outside her IT department for help with authentication and security and connecting the application to back-end systems. She chose DirectorySmart from Clearwater, Fla.-based OpenNetwork Technologies.

Povey could have outsourced to one of a growing number of application service providers that offer similar Web-based services to the health care industry. But by keeping the data in-house on its own legacy systems, Blue Cross can more easily and quickly provide real-time claims, eligibility and benefits information to members, she says.

Since rolling out the self-service application and the Voice Response Unit, an IVR system developed in-house that runs on IBM's DirectTalk voice-processing platform, resolution of mem-

ber inquiries has increased from 30% in 1999 to 43% in the first quarter of 2001. What's more, 97% of member inquiries sent via the Web were resolved immediately.

Since Forrester issued its report six months ago, vendors are "hitting their next wave of revisions," and e-businesses are beginning to realize that some tools will fit their needs, says Forrester analyst Bob Chatham. For example, vendors such as Primus Knowledge Solutions Inc., Kana Software Inc. and ServiceWare Technologies Inc. are helping companies consolidate customer data flowing in from multiple channels.

Moreover, despite still-unresolved software integration and customization challenges, Forrester concludes that if an e-business takes the right steps, it can realize as much as a 200% return on investment on a typical packaged self-service application by the fifth year of deployment. For example, answering a phone call

THE PAPER AND INK USED IN THE ORIGINAL PUBLICATION MAY AFFECT THE QUALITY OF THE MICROFORM EDITION

OFF THE SHELF

What to look for in a store-bought self-service system:

- The ability to tailor an FAQ feature to the context of your business
- Natural-language processing capabilities
- The ability to share a knowledge base across all channels, including e-mail, telephone and the Web
- Good data-import capabilities that allow for the easy incorporation of different file types and data forms in a knowledge base

Source: Forrester Research Inc., Cambridge, Mass.

costs \$12, compared with \$6 for an e-mail and 35 cents for an IVR interaction, according to Forrester. A typical self-service software package, including a knowledge-base server and associated hardware, license and maintenance fees and other costs, can add up to about \$250,000.

"When you look at the size of that investment, a 200% ROI over five years is pretty good," says Chatham.

But where business policies, technology infrastructure and customer relationships are already well established, many businesses are hard-pressed to find made-to-order software that fits their needs to a T, says Erin Kinikin, an analyst at Giga Information Group Inc. in Santa Clara, Calif. "Self-service applications are still at an early stage. Early adopters build, and then everyone in the mainstream learns, and then they buy," she says.

Also, early adopters don't always want to throw out their existing customer-assistance services and start over again.

Consolidated Freightways, a \$2.3 billion commercial shipping company, is a prime example. With 20,000 employees, 300 terminals and 29,000 truck trailers in North America, the company ships 55,000 loads of all types of material per day.

To help answer customers' shipping inquiries, Vancouver, Wash.-based Consolidated married a homegrown tracking system with packaged software from several vendors to manage 700,000 customer profiles in the company's database. Now, a suite of tools targeted at Consolidated's 150,000 customers lets them track shipments online as well as view bills of lading and receipts and generate electronic reports. Before, it cost up to \$5 every time a customer called about a shipment.

"We're a trucking company, not an R&D shop," says Martin Larson, Consolidated's CIO and vice president of e-commerce. "I have 200 IT people whose focus is not on creating everything from scratch. It's too much work."

Shunting customers and business partners to the Web can pay dividends in reduced call center costs, but people still like to pick up the phone. IVR systems can help companies achieve the same goal as a Web-based self-service application. And in this case, a vendor's software might just work.

Ford Motor Co.'s Business Assistance Center in Dearborn, Mich., installed IVR software from Nuance Communications in Menlo Park, Calif., last year, after it had purchased Siebel Systems Inc.'s Call Center software. Although they're separate, stand-alone packages, Siebel's software manages actual phone calls, while Nuance's manages automated voice responses to those calls. Complicated questions from Ford dealers, car rental agencies and corporate buyers can be handled by humans, while basic questions can be handled around-the-clock by the IVR system. Where the IVR system is available, it handles up to 20% of the 4 million incoming and outgoing calls per year.

"Many of our business partners wanted English-speaking answers to questions, rather than pressing phone keys to get information," explains Frank Veros, manager of the Business Assistance Center. "The accuracy got acceptable in the last 12 to 18 months, and these systems can handle [different] accents now."

The system was originally designed to help quell negative feedback about the push-button inquiry system, and, so far, it has, says Veros. It has also saved money. "People costs go up every year, so if I can reduce the head count in my call center by 50% by implementing an IVR system that customers can use 24 hours per day, I'll do that," he says.

Veros advises other companies to make sure the vendor will still be around after the software is purchased. He turned to Siebel and Nuance so he wouldn't have to hire an expensive consulting firm to install the software. Siebel stuck by his company during deployment. "A CIO doesn't want to spend millions of dollars on software and consulting and then have to cancel the project because they can't get it up and running," Veros says. ROI

money

Teaching Children Well

Self-service is second nature to tomorrow's corporate users BY PIMM FOX

COMPANIES DEBATING THE ACCEPTANCE OF self-service technology by customers or employees should meet Carol Brennan, 14. Brennan is a self-service wireless application user; she just doesn't know it.

To Brennan, having her Palm IIIc networked to those of 56 other freshmen at Convent of the Sacred Heart High School in San Francisco is cool and efficient. The concept of "self-service" never came up.

Every morning, Brennan points her Palm at one of three wall-mounted caching servers to get her class list, homework assignments and even classmates' birthday announcements. To Brennan and other students, such as Stephanie Gertz, 14, using the Palm with the wireless server is a no-brainer. It makes it possible to find out practice times for sports, as well as telephone numbers and e-mail addresses of friends and teachers.

"It just makes everything easier," says Gertz, who received her PalmPilot in the beginning of August as part of a program initiated by Doug Grant, head of the school.

Benefits of the wireless system so far include easier communication, less paper, trackable assignments and general excitement and spontaneity regarding the self-service application, says Grant, who got the idea for the system while attending a San Francisco Giants baseball game last spring. At PacBell Park, seven caching servers wirelessly deliver game schedules, team lineups, news and a score-keeping application to fans' PalmPilots for free.

At Sacred Heart, freshmen are responsible for getting the information they need to keep current with course work. For example, Kate Sylvia, 14, showed me the school's code of ethics and her latest history assignment. "There's no

excuse for me to not do my homework," she says.

Teachers use the system to communicate with students throughout the day. Kate Jackson, the school's IT specialist and cross-country coach, says that as the gatekeeper for information going out from the caching server, she had to create some guidelines for teachers.

"I get daily updates from teachers but have to place limits on how many words they can write. [I] asked them to have all weekend homework assignments in to me by Friday noon," says Jackson, a refugee from two dot-com flameouts.

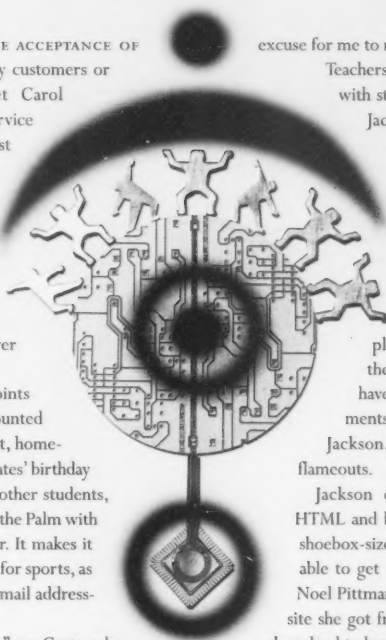
Jackson codes the communications in HTML and beams her PalmPilot toward the shoebox-size servers, and students are then able to get updates as they pass by. Indeed, Noel Pittman, 15, showed me a link to a Web site she got from a teacher after her morning download to her Palm unit.

While the freshman class and 20 teachers now use one server station, two others are planned — one for the faculty room and a mobile unit to be used as needed.

The server is powered by a lithium battery pack and designed to beam information up to 15 feet in a 60-degree arc. Installation takes a couple of hours — mainly for the wall mounting. The service costs \$75 per unit, per month, with an initial cost of \$200. Students' parents paid for the PalmPilots (they need to have a graphing calculator for math anyway), with volume discounts bringing the cost to \$100 for each device.

But there's one thing the wireless network has yet to curtail: All of the students I spoke with said they still talk on the phone with their friends.

ROI



leadership

Future-Proofing Self-Service

It requires more than being prepared technologically. BY GUS TAI

ALTHOUGH E-BUSINESS MAY BE PERCEIVED AS a failure by Wall Street and the press, at least one valuable lesson was learned during the dot-com boom and bust: Customers are quite happy to handle their own business, as long as it's easy to get the answers they want.

The good news about customer self-service is that when it's done right, the benefits are enormous. One customer relationship management (CRM) provider estimates that staffed phone support costs \$33 per transaction and e-mail support \$10 per transaction. When customers serve themselves, the cost averages \$1 per interaction, and when they find their question already answered in a list of frequently asked questions, the cost for support may be as low as 10 cents.

The ROI proposition of self-service is obvious, but making it work long-term for your business is by no means a no-brainer. Good self-service needs to match the forms of delivery expected by your customers — be it by voice, e-mail or instant messaging on the Web. These expectations will grow as new communication channels emerge. At the same time, rapid advancements in technologies — voice recognition, wireless, broadband, IP telephony and mobile — increase the odds that the systems picked today will become obsolete. These factors increase the risk of investing in self-service and the importance of making sure that any solution is ready for the future.

"Future-proofing" your self-service offerings, however, requires more than just planning for technological innovation, such as getting ready for the launch of Web access through interactive voice response or the replacement of keyword searching with natural language processing. Self-service will create new business demands that could easily be overlooked.

Realize that if your self-service offering is working, its use may increase faster than you might expect. Take, for example, automated teller machines (ATM). Mc-

Kinsey & Co. reports that in the late 1990s, ATMs were so popular in the U.S. that they were used for 700 million transactions, exceeding the number of branch transactions. If your adoption rate is similar, you could face a reduction in cost savings as volume outweighs the lower cost per transaction.

Customers will also expect self-service to integrate seamlessly into your company's overall CRM offerings. Just as e-mail drives use of more paper, good Web-based self-service ironically boosts call center activity.

At least today's CRM applications are already configured for this level of integration. Customers shopping for PCs at the Web sites of Hewlett-Packard and Dell, for example, are prompted by intuitive questions. If an issue should arise that can't be resolved through the Web interface, the CRM application can escalate the interaction to e-mail, chat or telephone. Of course, users can pick up the phone whenever they'd like. But it's in the interest of the company to keep the customer on the Web site. Or, if the customer does need to speak to a live representative, the company can at least keep the interaction online as a chat session or e-mail interaction.

Building self-service solutions is complicated, marrying business and technological issues. But companies shouldn't wait. The ROI from self-service is too great, whether in hard dollar savings or increased customer satisfaction.

ROI

What's the Relationship Worth?

How to measure company performance in a collaborative economy

BY JEFFREY SHUMAN AND JANICE TWOMBLY

EVERYTHING THAT WAS ONCE TRUE ABOUT BUSINESS IS no longer true. Why? Because of this fundamental truth: The power in business relationships has shifted to customers.

Whether you call it the New Economy, Real Economy, Internet Economy or Networked Economy, the promise of technology has arrived, and customers really are in control. This new balance of power changes everything — from what constitutes a business and the products and services it offers to our jobs and how we create value. As a result, we must expand our understanding of how we define and measure value and company performance.

Companies are realizing that to profitably satisfy customers, they must focus on what they do best and collaborate with their customers and other business entities. But for the collaboration to work, all parties must receive something they value. And if every party must receive something of value, then by definition, everyone is a customer.

By viewing everyone as a customer, you change the nature of business value. The flow of goods, services, information and money should therefore increase for all concerned. For example, Jeff Reichenthal, general manager of ClubSalon, knows that his customers include the manufacturers, distributors, salons and consumers in the \$45 billion salon and spa industry. ClubSalon, an Internet-based industry resource, is generating incremental business for manufacturers, distributors and salon owners by providing them with valuable tools, resources and marketing programs that are truly customer-oriented.


Companies must learn that value can be realized through the exchange of currencies other than cash. According to generally accepted accounting principles, fair market value is measured based on that which is given up. And that's the point: Value is in the eye of the beholder. Most companies base their pricing on costs, rather than on the value they deliver. Only recipients can assess the relative value of something they receive. And in many instances, non-cash currencies can be of equal or greater value than cash.

What are some other currencies? Here's a partial list: 1. access to information; 2. access to customer lists; 3. access to the skills necessary to grow business; and 4. third-party validation, such as customer references or awards.

For example, you can share value in a relationship with a supplier (now also viewed as a customer) by sharing customer information that will help that supplier do a better job. In exchange, the supplier may lower your costs. And just as cash is factored into determining company performance, these noncash currencies must help define value and assess performance.

The answer to measuring company performance, now that everyone is a customer, is through the use of a new managerial tool: net relationship value, or the value of a relationship in achieving your strategic goals. (See more about net relationship value at www.computerworld.com/roi.)

With the net relationship value tool, we can for the first time measure currencies other than cash and use those values and measures to accurately manage the allocation of resources to improve overall company performance. ROI



NUMBER OF PEOPLE
ON YOUR NETWORK

NUMBER OF PEOPLE
ON YOUR BACK

RETURN ON COMMUNICATIONS

Fact: The sales department has different needs than HR. Or manufacturing. Or customer service. And they all need to be on your network. But it's not enough to build a network just to run everyone's apps. You need one that'll do so without causing you massive headaches. And that will return your investment. Short and long term.

That's where AT&T comes in. We know complex networks. We know reliability. And we know results. Proof? For **Steelcase**, we put 30 factories and 16,000 employees on a single North American network, speeding up customer service and saving hundreds of thousands of dollars a year.

Want similar returns? AT&T can help you get them.

Call AT&T toll free at 1 866 745-2669 or visit us at www.attbusiness.com/return



Continued from page 1

Storage Net

Steve Duplessie, an analyst at Milford, Mass.-based Enterprise Storage Group Inc., said the installation at Edward Jones is one of the biggest corporate storage-over-IP projects to date. "This says not only is it possible to do, but someone is actually doing it," he said.

The Fibre Channel-over-IP technology that Edward Jones used to link storage-area networks (SAN) is cutting-edge, agreed Jamie Gruener, an analyst at The Yankee Group in Boston. Storage over IP is "less common today than anything else, but longer term, it's something we'll see more of as customers deploy SANs across their enterprise," Gruener said. "The market is small today, but it will grow rapidly over the next two to three years."

Edward Jones began its project Oct. 15 and recently completed the data center in Tempe, though its IT team is still dealing with issues related to connecting the two computing facilities. Malone said about \$1 million of the overall project cost was spent on 10 director-class switches to connect the firm's two SANs.

100% Uptime Expected

The expected return on investment is tied to the 100% uptime that Edward Jones anticipates under virtually any circumstances, Malone said. He added that the new network also gives the company the ability to easily expand its network to meet the needs of its 5.4 million customers and 8,000 branch offices, which are increasing at the rate of 100 new offices every month.

"We still are not as in sync and as fast as we want to be [sending the data packets]," Malone said. "We have more testing to do and fine-tuning on the things we've got. We're

probably another 90 days from being where we want to be."

According to officials at Lumberton, N.J.-based Inrange Technologies Inc., which is the vendor supplying the storage networking technology to link Edward Jones' two data center SANs, using IP connections should reduce a company's carrier costs by up to 90%. Malone disagreed with that figure but said he does expect significant savings.

An emerging protocol, Fibre Channel over IP has its problems, not the least of which is latency associated with sending data packets over long distances. Fibre Channel, which was designed for campus settings or metropolitan-area networks, doesn't travel farther than 100 kilometers because the data packets break down.

Edward Jones previously relied on Rosemont, Ill.-based Comdisco Inc. for IT backup

services, but Malone said the firm outgrew that arrangement. "Our problem was how to continue to grow, supply 7-by-24 uptime and provide 200 vendor circuits," said Malone, referring to telecommunications circuits that run to various exchanges and customers.

"The other problem was how to manage that growth and the growing complexity of our computing environment and make it as simple and easy as possible to back everything up and switch from one location to another," he added. Edward Jones relies on a mixed bag of storage boxes, servers and network devices in its data centers, including IBM mainframes, EMC Corp. Symmetrix disk arrays and Network Appliance Inc. direct-attached storage. It also runs Sun Microsystems Inc. and Compaq Computer Corp. servers and Cisco Systems Inc. routers.

The solution for Edward Jones was to use new technology that compresses many Fibre

The events of the last several weeks mean you need good, solid redundancy.

RICH MALONE, CIO,
EDWARD JONES & CO.



Channel data packets into a single group. Those packets are then wrapped in TCP/IP packets that can be carried over longer distances across a virtual private network. ■

How Fibre Channel Over IP Works

- **Fibre Channel**, which was designed for campus settings or metropolitan-area networks, doesn't travel more than 100 kilometers because the data packets have varying amounts of latency, depending on their size.
- In order for Fibre Channel to work, "send" and "receive" response times must take place within a certain time window.
- Because of these time constraints, latency associated with groups of data packets being sent more than 100 kilometers exceed the send and receive window, which cancels the transmission.
- Fibre Channel over IP works by compressing many data packets into a single group and then capping them off with TCP/IP packets, which can be sent across greater distances.

Continued from page 1

Exodus

"It insulates you from exactly the kind of situation that Exodus is in," said Steve Wigginton, executive vice president of marketing, operations and development at Neoforma.

Under the ongoing bankruptcy, which is set to be finalized next month, 30 of Exodus' 48 hosting data centers will be sold to Cable & Wireless PLC (C&W) for about \$575 million in cash. London-based C&W hopes to keep most of Exodus' approximately 3,500 Web hosting customers as it takes over the firm's operations and expands into the market. Santa Clara, Calif.-based Exodus is one of the world's largest Web hosting companies.

But assuming that the sale of the data centers to C&W is approved by the bankruptcy

court, the Web sites of Exodus' existing customers apparently won't miss a click. Exodus will pay to migrate customers whose Web hosting facilities are in the 14 data centers not being bought by C&W, said an Exodus spokeswoman.

For at least one Exodus customer, however, those assurances weren't enough.

Dan Agronow, vice president of technology at Weather.com, the Web site of The Weather Channel Enterprises Inc. in Atlanta, said Exodus' bankruptcy filing was only one of several factors in his company's decision to switch to WorldCom Inc. for its hosting services just last week.

While Weather.com was satisfied with the service it received, it had "concerns related to the ongoing Exodus support and financial stability," and it saved money by going with WorldCom, he said. "Since we had those concerns,

we started looking around," explained Agronow. The final decision to switch was made before the Exodus bankruptcy was announced, he said.

Ironically, Weather.com used C&W as a hosting firm before switching to Exodus in late 1999, Agronow said. That prior

experience wasn't good, he said, adding, "They seemed to have a lack of experience that impacted customers often. It was a challenge to work with them."

Tim Tuttle, chief technology officer at Bang Networks Inc., a network services and systems consultant for banks, said that as an Exodus customer, he hasn't seen any degradation in service since the company was hit by its ongoing financial problems.

San Francisco-based Bang has been using Exodus for about a year as a secondary hosting provider for redundancy purposes. The bankruptcy and sale of the data centers to C&W won't necessarily mean any changes in that relationship, said Tuttle, who added that he's pleased with the pending buyout by C&W.

"We're relieved and our customers are relieved that they're taking over," he said. ■

Exodus Lifeline

The sale of assets to Cable & Wireless means continued service to Web hosting customers.

Under the deal, which awaits bankruptcy court approval, C&W would:

- **Buy 30 of Exodus' 48 data centers, including 26 in the U.S.**
- **Pay \$575 million in cash and assume \$180 million in liabilities.**
- **Assume contracts for about 3,500 Exodus customers.**

FRANK HAYES/FRANKLY SPEAKING

No Magic Bullet

AW, FER CRYIN' OUT LOUD! It's another e-mail worm — and this one goes on a search-and-destroy mission that wipes out antivirus and firewall software, installs a back door for future attacks and, of course, if the user has Microsoft Outlook, resends itself to every e-mail address it can find.

And the most aggravating part is, this Goner worm doesn't even try to infect systems by itself. We're completely safe from it unless some nitwit user activates it by running the program.

Which some nitwit user always seems to do.

Oh, we've *tried* to convince them not to open the love letters, the screen savers, the anthrax warnings, the non-business-related Web pages attached to their e-mail. We've threatened. We've cajoled. We've made rules. We've sent out memos. We've put on security dog-and-pony shows. We've audited users' computers. We've blown the whistle on known nitwits.

None of that solves the problem.

Can't we find a workable, practical, permanent way to keep lamebrained users from opening security holes that some cracker could drive a virtual truck through?

No, we can't.

That's not fatalism or defeatism — letting the cyberterrorists win, as it were. It's just realism.

And as long as we keep looking for a magic bullet, some special approach or secret trick to protect us all from these users once and for all, we're wasting our time.

There's no magic bullet for nitwit users for the same reason there's no magic bullet that can protect us from every worm and virus and cracker. Security problems aren't like software bugs or hardware glitches. They aren't one-time mistakes that can be identified, solved and forgotten.

Security problems are *created*. They're created by crackers and virus writers and cybercrooks who work hard looking for vulnerabilities and ways to exploit them. These people are constantly hunting for new weaknesses, or new ways of leveraging old weaknesses.

Which is why security is a constant struggle. It's patch and update and adjust and repair and upgrade. New problems turn up all the time, even in systems we thought were airtight. There's no

permanent fix that guarantees a system is safe forever — at least, not short of pulling the plug on it. So we're always scrambling, at best one step ahead of another worm or virus or break-in.

And it works the same way with users — especially the gullible, naively curious users who are most likely to open e-mail attachments or click on mystery Web links.

The same virus writers and crackers who are constantly searching for security holes in the technology are always looking for vulnerabilities in users, too.

They poke and prod, try new angles of attack — love letters, jokes, games — and when they find one that works, they go after it with everything they've got.

This "social engineering" isn't new. Crackers have been using it for decades. But somehow we want to believe that user vulnerabilities are different from technical vulnerabilities — that the human element should take care of itself, and all we should have to do is patch and update and repair the technology.

Sorry, but it ain't so. And it never will be.

Security problems are security problems — human or technical. That constant struggle to deal with vulnerabilities will always be there. And the biggest bunch of vulnerabilities you've got will always be the flesh-and-blood kind.

So forget about looking for the right approach, the best tactic, the perfect way to prevent security nitwits. You'll never find it. All you can do is keep reminding users, and threatening, and explaining, and blowing the whistle.

That's no magic bullet — but it's still your best shot. ■



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SHARK TANK

NETWORK ADMIN pilot fish is trying to help out a help desk tech with a server problem. Try using the ping function to make sure there's a good connection and the server is working, fish suggests. "Yeah, I can ping it, all right," says tech. Fish tries himself, but fails. "Are you sure you can ping that node?" he asks tech. "Yup," says tech. "I can ping it. It just doesn't respond."

IT DIRECTOR pilot fish has been trying for three years to get his salary up to industry average. But his CFO won't budge. "Well, somebody has to be on the bottom," says CFO. "That's how we get averages."

SECURITY CHIEF pilot fish spends two hours hardening his financial services facility against unauthorized access. But he's horrified to watch a local pizza delivery guy walk right into the computer room to hand a late-night pie to the systems operators — using his own newly issued card key.

"I CAN'T GET my dial-up Internet connection working," remote user calls to tell support pilot

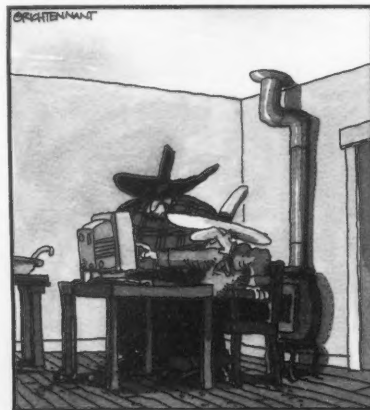
fish. "I get a message saying some program is missing." All I can do is overnight you a disk to reinstall the file, fish says. "Why?" user asks. "Can't you do that remote-control thing like you did last time you helped me?"

PLANT MANAGER hands IT director pilot fish a 20-page document. Could you send this by e-mail? We no longer handle hard-copy documents, fish says. Plant manager agrees. "But I'd really like you to review it as soon as possible," he says. "It's a proposal to switch all forms and documents to electronic format."

WHAT EXACTLY DOES the "Office Assistant" in Microsoft Office do? user asks net admin pilot fish. Fish explains it's for accessing the software's help files. Humbled user says, "I thought if I clicked on it, someone from HR would come over to assist me. But I was afraid to try it."

Go ahead, try me: sharky@computerworld.com. You score a snazzy Shark shirt if your true tale of IT life sees print — or if it shows up in the daily feed at computerworld.com/sharky.

The 5th Wave



"Well shoot — I know the animation's moving a mite too fast, but dang if I can find a 'mosey' function anywhere in the toolbox!"

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If you ask IBM, e-business is complicated and hard. So don't ask them.

With fourteen operating systems, multiple chip architectures and a tangle of middleware to deal with, it's no wonder only IBM can "integrate" their systems. And with their closed, complex systems, they control it all. Which means you'll pay—and pay—for their monopoly on service.

On the other hand, Sun takes out complexity. Sun systems run on one chip architecture and a single operating environment, so you can scale from under-\$1,000 desktop systems to over-\$10-million data center systems without breaking a sweat, something you won't find at IBM. So if you want to lower your TCO (and who doesn't?), Sun lets you run the same applications, the same middleware (directory, portal, app server, etc.) and the same administrative framework across your entire IT environment. Which means you can use a single set of tools to develop all your applications. So there's no recoding, no retraining and no expensive consultants to come in and "manage" it all for you. You can even share the same system components between your midrange and data center-class systems. That's how you reduce complexity and bring down the cost of running your business. Big time.

IBM has it all wrong: e-business doesn't have to be complicated or hard. You just need the technology and partners that all speak the same language: yours.

take it to the nth



